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[The following essay upon the natural history of the Rose Bug, was prepared by Dr. T. W. Harris of Milton, with a view to the premium offered by the Massachusetts Society, for promoting agriculture, for the best essay on this subject; but the professional avocations of the amiable and learned writer having prevented the completion of it within the period fixed by the Trustees, he had resolved to suppress it. The progress which he had made, having come to the knowledge of the President of that Society, he urged Dr. Harris to lay it before the Trustees in its present state, and they were pleased to award the Society's premium to the author. We think the readers of this journal will feel obliged to us for inserting it.]

MINUTES TOWARDS A HISTORY OF SOME AMERICAN SPECIES OF MELOLONTHÆ PARTICULARLY INJURIOUS TO VEGETATION.

Nempe *Melolontha* dicitur, quia pomorum est pernicies.

BOCHART.

THE Linnean genus SCARABÆUS is very abundant in species, and exceedingly numerous in individuals of some species. These insects are easily recognized by their moveable horns, or *antennæ*, projecting above the mouth, and terminated by several lamellated, or leaf-like joints, whence they have received the name of Lamellicorn beetles. This genus contains insects differing much in external appearance, and in their modes of life, and has therefore been subdivided into several smaller genera by the Entomologists who have succeeded Linné. De Geer distinguished three families, according to their habits, which he called *Scarabés de terre*, (Earth-beetles,) *Scarabés des arbres*, (Tree-beetles,) and *Scarabés des fleurs*, (Flower-beetles.) Those

of the second family are most interesting to the agriculturalist, because of their extensive ravages. They are included by Fabricius in his genus MELOLONTHA, a word used by the Greeks to distinguish these same insects, and which signified, according to Eustathius, that they were produced from or with the flowers of apple-trees.* The MELOLONTHÆ are called in England *dorrs* or *chaffers*.

The genus MELOLONTHA may be characterized as having the *body* oblong, oval, and convex; the mouth covered above by a thin plate, called *clypeus*, beneath which are situated the *antennæ*, consisting generally of ten joints, the terminal ones united by one end to a common centre, and expanding like the leaves of a book: the *thorax* (situated behind the head) convex, more or less quadrate or trapezoidal; immediately behind this, and between the wing-cases, a small triangular piece called *scutellum;* wing-cases or *elytra* convex above, not embracing the sides of the body, and leaving the posterior extremity exposed: legs of moderate length; the middle part or *tibiæ* of the anterior ones armed with two or three lateral teeth; and each foot, or *tarsus*, consisting of five small joints, and terminated by two strong claws or *nails*.

The general habits and metamorphoses of these insects are invariable; a description of those of the common cockchaffer of Europe, (MELOLONTHA *vulgaris*, *F.*) will serve to elucidate those of the whole genus. These are detailed by Latreille, (in the tenth volume of his Histoire Naturelle, embodied in Sonnini's Buffon,) and by Olivier, in the first volume of his Entomology.

* ἀπ τῆς τῶν μηλέων ἀνθήσεως. Dumeril derives the word from μηλον, an orchard, and υνθος, dung. The French name is *hanneton*, probably a corruption of *aliton*, from *ala* and *tono;* to make a loud noise with the wings. By several critics the *Jelek* of the Hebrews, translated *canker-worm*, was considered as some insect of this genus. The words of Nahum, III, 17, appear particularly characteristic of the manners of the nocturnal species; "which camp in the hedges in the cold day, but when the sun ariseth they flee away, and their place is not known where they are."

This insect devours the leaves of trees and shrubs. Its duration in the perfect state is very short, each individual living only about a week, and the species entirely disappearing in the course of a month. After the sexual union has taken place the males perish, and the females enter the earth, to the depth of six inches, or more, making their way by means of the strong teeth which arm their anterior tibiæ: here they deposit their eggs, amounting to nearly one hundred in number, from every female, which are soon after abandoned, and the females ascend to the surface, and, after languishing a few days, perish also.

From the eggs are hatched, by the warmth of the earth, little whitish grubs, called, in France, *vers blancs*, each provided with six legs, situated near the head, and the mouth furnished with two strong jaws. They live on the roots of plants and other vegetable substances found in the ground; gradually increase in size, and change their skins once a year, about the commencement of spring, after which they approach nearer the surface in search of food; for during the winter they do not eat, but, having penetrated below the reach of frost, remain torpid until the succeeding spring. At the close of their third summer they cease eating, and penetrate about two feet deep into the earth: there by its motions from side to side the grub forms an oval cavity, which is lined by its excrements, and some glutinous fibres, in which it is changed to a pupa by casting its last larva skin. In this state the legs, antennæ, and wing-cases are visible through the transparent skin which envelopes them, but appear of a yellowish white colour; and thus it remains until the approach of the ensuing spring, when the thin film which encloses its body and limbs is rent, and the perfect insect digs its way to the surface of the ground, where the superabundant moisture with which it is imbued, is exhaled, and it expands its wings and takes flight.

According to Kirby and Spence the grub of the cockchaffer sometimes destroys whole acres of grass, by feed-

ing on its roots. It undermines the richest meadows, and so loosens the turf that it will roll up as if cut by a turfing spade. About seventy years ago, a farmer near Norwich in England, suffered much by them, and, with his men, gathered eighty bushels of the beetle. In the year 1785 many provinces in France were so ravaged by them, that a premium was offered by government for the best mode of destroying them. They do not confine themselves to grass, but eat also the roots of wheat and other grains.

In their perfect state these, with several other species, act as conspicuous a part in injuring the trees as their grubs do in destroying the herbage. Besides the leaves of fruit-trees they devour those of the sycamore, the lime, the beech, and the elm. Mouffet relates that, in the year 1574, such a number of them fell into the river Severn, as to stop the wheels of the water-mills; and, in the Philosophical Transactions it is stated that, in the year 1688, they filled the hedges and trees of Galway in such infinite numbers, as to cling to each other like bees when they swarm; and when on the wing darkened the air, annoyed travellers, and produced a sound like distant drums. In a short time the leaves of all the trees for some miles round were so totally consumed by them, that at midsummer, the country wore the aspect of the depth of winter.

Another chaffer (MELOLONTHA *vitis*, F.) is sometimes exceedingly injurious to the vine. It prevails in certain provinces of France, where it strips the vines of their leaves, and also devours those of the willow, poplar, and fruit-trees.

The animals and birds, appointed to check the ravages of these insects, are, according to Latreille, the common dung-hill fowls, different species of owl, the European goat-sucker or night hawk, (CAPRIMULGUS *Europæus*,) bats, rats, the weasel, (MUSTELA *vulgaris*,) the martin, (MUSTELA *foina*,) and the badger, (URSUS *meles*.) To this list may be added the common crow, which devours not only the perfect in-

sect but their larvæ, for which purpose it is often observed to follow the plough. Our own country abounds in insectivorous beasts and birds, and, without doubt, the more than abundant MELOLONTHÆ form a portion of their nourishment.

We have several allied species of MELOLONTHA, whose injuries in the perfect and grub state approach to those of the European cock-chaffer. The most common one is the M. *quercina* of Knoch; (in Melsheimer's catalogue;) it is not described by any author to which I have had access. It is of a dark chestnut-brown colour, glabrous, punctate; the breast pubescent; and each elytron with three elevated lines: length eight tenths, breadth nine twentieths of an inch. This insect agrees very well with the figure and description of M. *Fervida* of Olivier; but, on the authority of Mr. Say, it is considered as the species described by Knoch (in his Neuv. Beiträge zur Insectenkunde) by the name of *quercina*. In its perfect state it feeds on the leaves of trees, particularly of the cherry-tree. It flies with a humming noise in the night, from the middle of May till the end of June, and frequently enters houses, attracted by the light. The grubs devour the roots of grass and other vegetables: in many places the turf may be turned up like a carpet, in consequence of the destruction of the roots. The grub is a white worm, with a brownish head, and when fully grown nearly as thick as the little finger.* It is eaten with avidity by crows and fowls. The perfect insect is devoured by some insectivorous animal, which frequents our gardens for that purpose, and whose beneficial foraging is detected by its abundant excrement, filled with the wing-cases of the MELOLONTHA.

M. *balia*, (Say,) a smaller species than the *quercina*, may,

* There is a grub, somewhat resembling this, which is frequently found beneath manure-heaps, and is commonly called *muck-worm*; it differs, however, in some respects, from that of the MELOLONTHA, and produces an insect generically distinct, which is described as the *Scarabæus relictus*, by Mr. Say.

according to Mr. Melsheimer, "be found in its proper season in vast numbers under the deciduous leaves of forests: during the night the millions of wings that fan the air produce a loud humming sound, not unlike that emitted by the enraged occupants of a humble-bees' nest." This species, with another, M. *hirsuta*, (Knoch,) are found in Massachusetts, but not in such quantities as the *quercina*. The *balia* is of a light chestnut-brown; head and thorax blackish brown; the former and the breast beneath hairy. It is rather more than thirteen twentieths of an inch long. M. *hirsuta* is dark chestnut, and hairy; the thorax with dilated punctures, and the wing-cases with five or six longitudinal series of hairs on each. Length seven tenths of an inch.

Several other species are common here, but their specific names are at present unknown to me. Of the smaller ones, are some which attack the wild rose and whortle-berry bushes. These are M. *vespertina* and M. *sericea* of Knoch, and M. *iricolor* of Say. About the last of June and first of July the two first of these species may be found in the evening on the Rosa *rubiginosa*, in great abundance, and generally paired. Mr. Melsheimer says that M. *iricolor* "abounds in hilly and mountainous situations, where, in the month of May, the time of the sexual union of the species, it may be seen flying amongst the whortle-berry bushes in profusion."

These species are *nocturnal* insects,* never appearing,

*The genus MELOLONTHA, as constituted by Fabricius, contains a vast number of species, differing greatly in external appearance, and somewhat in modes of life. Fabricius describes 149 species, and Schönherr, after separating those which constitute the modern genera ANISONYX, GLAPHYRUS, AMPHICOMA, RUTELA, and HOPLIA, enumerates 226 species of MELOLONTHA, to which additions are constantly making from the discovery of new species. Hence the genus requires further subdivision. The bases of these subgenera have been pointed out by Latreille, Knoch, and Schönherr, and some have already been established. I would restrict the name of MELOLONTHA to those species which have more than three lamellæ to the club of the antennæ, like the *vulgaris* of Europe, and of which we have an indigenous example in the M. *decemlineata*, of Say, (M. *occidentalis*, Herbst?) Our

except by accident in the day, during which they remain under the shelter of forests, or concealed beneath the leaves of shrubs and grass. Others are truly *day-fliers*, committing their ravages by the light of the sun, and always present to our observation.

One of them appears about the middle of May. It eats the leaves of the pear-tree, and feeds also on those of the poplar and oak. It is a large insect, and was described by Linné as the SCARABÆUS *lanigerus*. The body is of a broad oval shape, and compressed or flattened; the head and thorax yellow, bronzed; the wing-cases pale yellow, punctate; the legs brownish yellow with shades of green; the body beneath green-bronzed, and clothed with long yellow down. Length nearly one inch; breadth rather over half an inch. It is not constant in its appearance; in some seasons being found in great profusion, when, by shaking the young pear-trees, any number of them may be obtained.

Another large species attacks the grape-vine. It is the SCARABÆUS *punctatus* of Linné. The wing-cases are testaceous or brownish-yellow, with three distant black spots on each: the thorax darker, slightly bronzed, with a black spot each side; the head green-bronzed round the eyes; the body beneath and the legs deep green, bronzed. Length one inch, breadth over half an inch.

A small species also attacks the vine; it is closely allied to the M. *vitis* of France; but, fortunately, its ravages are not so extensive as those of the latter. It is the M. *varians* of Fabricius: Is of a broad-oval shape, the elytra testa-

common species *quercina*, *hirsuta*, *horticula*, *balia*, and some others might receive the generic name PHYLLOPHAGA. M. *vespertina*, *sericea* and *iricolor* would form another subgenus, which might be called STILBOLEMMA, unless they are included in SERICA, MacLeay, or OMALOPLIA of Megerle; the characters of their genera I have not seen. M. *pilosicollis*, *longitarsa*, and *moesta* of Knoch and Say should each constitute a subgenus. The latter (with M. *sordida* and *frondicola*, Say?) belongs to Kirby's genus APOGONIA. From the singular manner in which the nails are divided at tip, I would call the *linearis* of Schönherr DICHELONYX.

ceous; the central part of the thorax, the head around the eyes, the body beneath, and the legs blackish green, and bronzed, in the male; in the female these parts are of a pale brown colour. Length of the male seven twentieths, breadth one fifth of an inch. Length of female two fifths, breadth five twentieths of an inch. It feeds on the cultivated and wild grape-vine, and also on the sumach.

The *rose-chaffer*, or *rose-bug*, as it is commonly called, is also a diurnal MELOLONTHA. It is, exclusively, an American insect, and presents such peculiarities in form as would warrant its separation from the genus MELOLONTHA,* although it agrees with others of the genus in habits and œconomy.

This species is described by Fabricius as MELOLONTHA *subspinosa*, because the thorax is armed, on each side, with a blunt spine or tubercle; it is called M. *polyphaga* by Melsheimer, probably because of its voracity; *elongata*, by Herbst, from its elongated form; and *angustata*, by Beauvois, from the narrowness of its thorax. A description of this well known insect would be superfluous.

As to its habits—among the most remarkable are its voracity and salaciousness. It attacks, without much discrimination, almost every tree, shrub, and plant, such as the oak, elm, cherry, and apple trees, the rose, sumach, and elder shrubs, and even herbaceous plants, particularly the common white-weed, CHRYSANTHEMUM *leucanthemum*. Generally, during the day-time, we find these insects pair-

* STENOTHORAX would be an appropriate name for the subgenus having the *subspinosa* for its type.

SCARABÆUS *lanigerus*, Linnæus MELOLONTHA *lanigera*, Fabr. has been referred to the genus RUTELA; but Schönherr says it is not a RUTELA, and arranges it between M. *fastuosa*, and M. *aurata*, F., belonging to the genus ANOMALA? it may therefore be considered as the type of a new subgenus. See Schönherr's Synonymia Insectorum. III. p. 504. SCARABÆUS *punctatus*, Lin., MELOLONTHA *punctata*, Fabr, or RUTELA *punctata*, Latreille, belongs to Mr. MacLeay's genus PELIDNOTA.

MELOLONTHA *varians*, Fabr. is congeneric with the ANOMALA *vitis* of Megerle and Köppe.

ed, the male holding the female closely embraced, even when not *in coitu*. The male is readily distinguished by the greater length of the legs, and the elongated, pointed extremity of the body.

The rose-chaffer makes its appearance at the time of blossoming of the damask rose, which usually happens about the middle of June. It is remarkable that it does not attack the cinnamon rose, which blooms earlier, and is often found on the elm and oak before it appears on the garden and wild rose. It continues about four weeks, and then suddenly disappears, and in three or four days scarcely an individual is to be seen. The first *rose-chaffer* that I observed the present year (1826,) was discovered on a small elm shrub, on the sixth of June; none had as yet appeared on the rose. The general disappearance of these insects took place on the eighth of July, although a few individuals still remained on the flowers of the elder, as late as the fifteenth of July. A vulgar notion prevails that the rose-bug turns into a green horse-fly, because the common TABANUS makes its appearance about the time that the former disappears. This opinion is incorrect, though not more inconceivable than the known metamorphoses of insects.

After the sexual union is accomplished the males perish: you may then see thousands of them dead on the ground beneath your rose-bushes, and you will seldom find a female among them. The latter at this time enter into the earth to deposit their eggs. I have found the female more than a foot below the surface, where she was probably preparing to oviposit. Towards the termination of their ravages the females are frequently found solitary, seem considerably defaced, the downy coat which covers their thorax and elytra being rubbed off. From this circumstance we may conjecture that these individuals have already entered the earth and deposited their eggs, and have

returned to the surface to linger a few days without further sexual union.

I have not ascertained the period when the larva is hatched, nor the length of time that expires before it attains its growth. Nor am I positive as to the identity of the larva; although I have strong reasons for believing that what I have taken to be such is really so; further observation is however necessary. The supposed larva is a small white grub; the head covered with a corneous shell of a yellowish colour; the mouth armed with strong mandibles or teeth; and the anterior extremity furnished with six short feet; a dark line runs down the back, occasioned by the dorsal vessel, containing a blueish fluid, which is conspicuous from the transparency of the skin. The larva moves with considerable celerity when first taken out of the earth: it is about half an inch long, and one line in diameter. That it is the grub of a MELOLONTHA is certain from its close resemblance to that of others of this genus; that it is, most probably, the larva of the rose-bug is to be inferred from its being found in the same location as the pupa, and in considerable quantities.

The *pupæ*, from which I obtained rose-bugs, were found, early in June, (1826,) three or four inches beneath the surface of the ground. They are of a yellowish white colour, which gradually becomes darker as they approach the perfect state. In the pupa the rudiments of the wings, the antennæ and the legs are discoverable, folded under the body, and enclosed beneath a thin membrane, which wraps each separately; the eyes appear as two blue spots; the dorsal segments of the body are prominent in ridges; the tail is acuminated, and retains upon it the exuviæ or cast-skin of the pupa, until a few days before it throws off its last covering, and emerges from the earth a perfect insect. This last and important change is not effected but by the greatest efforts, during which the pupa appears to writhe in agony, until, by its continued exertions, it bursts

its membranous shroud, and crawls to the surface, where its wings are expanded and dried, and it becomes, from a grovelling worm of the earth, an animated tenant of the air. This interesting metamorphosis I had the pleasure of witnessing through the side of a glass vessel containing earth in which I had placed several of the pupæ.

An insect in its larva or grub state may be said to be *in embryo;* as its organs are more and more developed, the different *membranes*, or skins, are successively ruptured and cast off, and when it has finally extricated itself from its last covering, and emerged from its mother earth, it bursts into life a perfect adult, and finds itself endued with new powers, and feels the influence of new desires. In this state, only, is it capable of continuing its species, and furnished with wings to carry it through the air in search of companions and food.

Rose-bugs are eaten greedily by fowls; but young chickens sometimes suffer severely from swallowing them alive. A simple remedy consists in pouring sweet-oil down their throats. When the powers of the rose-bug are exhausted it falls to the ground, and furnishes food for various insectivorous animals, particularly ants. In France, a large insect, called *vinaigrier*, (CARABUS *auratus*, Lin.) devours the female MELOLONTHA *vulgaris* at the moment when she is about to deposit her eggs. I have taken one specimen of this fine CARABUS in this state, and we have several other species which are equally predaceous, and which probably contribute to check the increase of our native species of MELOLONTHA.

French writers mention several methods which have been proposed for the extermination of these insects. Most of them are ineffectual.* BUCHOZ, in his *Histoire des Insectes nuisables*, I., 132, says, that Christian Kleeman, in a memoir sanctioned by the Electoral Palatine Academy, gives the history of that species called by the French *Hanneton vul-*

* See Nouv. Dictionaire d'Histoire Naturelle; article *Hanneton.*

gaire. His observations were made in 1761 and 1762, when these insects were very numerous and destructive. He recommends making a general pursuit of them; declaring that he had killed more than one thousand in one day. This I suspect will prove to be the best method. It has been found useful to strew upon the grape-vine air-slacked lime, which causes the rose-bugs to abandon it. Fires by night do not attract them. I have held a bright light close to them, in a dark night, without in the least exciting them; and although this light was exhibited in the open air, in their immediate vicinity, for a long time, not one rose-bug approached it. The Abbe Rosier, in his *Cours d' Agriculture*, (article *Hanneton*,) advises to collect and destroy the perfect insect for several years in succession. This should be made a general pursuit in order to be effectual; and females and children might be employed in it.

The causes that contribute to the growth and increase of the larvæ are not sufficiently understood. The severity of winter, and the coldness and moisture of a succeeding spring, do not always appear to check the numbers of the perfect insect, which are often, according to Olivier,* developed in greater abundance after such seasons. Neither can we predict a great increase from an abundant oviposition; for the eggs may not be hatched, the larvæ may perish, or the pupæ remain too weak to undergo their last metamorphosis. On the contrary, a small number of eggs, deposited under circumstances favourable to their being hatched, and the larvæ perfected without accident, will cause an increased quantity of the perfect insects.

Certain localities are thought to be favourable to the increase of the rose-bug; what these are I have not ascertained; but should imagine that a warm, fertile, and rather dry soil, which is not disturbed by the plough or spade, would furnish an appropriate *nidus* for the eggs.

* Olivier's remarks refer to the M. *vulgaris*.

ON THE CULTURE OF LUCERNE: TRANSLATED AND ABRIDGED FROM THE COURSE OF AGRICULTURE OF THE ABBE ROZIER.

THERE is no branch of agriculture which has been more neglected in the State of Masssachusetts than that of the cultivated grasses. Till within a few years our farmers rarely sowed any grass seeds, but those of clover and herd's grass or timothy, as it is called in the middle States. If the farmer should say, that they are good enough for all their purposes, our reply would promptly be, how can you know that until you try others? That there are better grasses than either of them for certain purposes, and on certain soils, we know.

The objections to red or Dutch clover are numerous. It is apt to be winter killed, much more so than the plant we shall recommend in its place; in strong soils, it is too luxuriant; its stalks are coarse, and are rejected by all but very hungry cattle; its leaves are very apt to fall in drying, and every time the hay is removed; lastly, it lives but two years; if it did not sow itself, when left to stand till herd's grass is ripe, there would not be a trace of it the third year. These are serious objections. There are some objections to herd's grass, though smaller in degree. It is not well adapted to dry soils; it is a late grass, gives no early feed, and no after-math or after feed to any valuable extent. We shall speak of its partial substitute hereafter,—we mean the Orchard grass. This grass has been the subject of discussion these thirty years, but it is only within ten or fifteen years, that its merits have been admitted, and that it has been cultivated for some purposes in preference to Herd's grass. The Connecticut farmers, we believe, were the first who cultivated it in New England, and John Prince, Esq. was the person who first introduced it into this vicinity. It may be now considered as having fairly overcome prejudices, and when its seeds can be easily procured and at a cheap rate we shall see as many fields of it as of herd's

grass; the latter, however, will always be preferred in low lands. It is not to us extraordinary that it did not make its way earlier. Our farmers have a contempt for every thing new, especially if it is proffered by "book farmers." It was more than forty years after "Spinach" was introduced into the gardens of the opulent before you could buy it at Boston market, though it had been a regular and important article at Covent Garden, and in the Paris markets, for more than one hundred years. The disgrace of being so slow to receive valuable novelties is not confined to *our* farmers and gardeners. The medical faculty of Paris proscribed as poisonous the potato one hundred years after that plant had raised millions of vigorous, and athletic troops, who, under Marlborough, had beaten the finest armies of France! Let us delay our translation one moment more, by saying that even now the Salsafy can hardly be said to be a regular marketable article; that the Rhubarb was twenty years in coming into favor, and that the Sea kale, the favorite vegetable of Great Britain, cannot find one intelligent cultivator, who will tempt the Boston gentlemen with this luxury.

As Orchard grass is now admitted to be worth cultivating, we may hope that Lucerne, or as the French call it, Luzerne, will have a fair trial as a substitute for clover. Will Lucerne bear our climate? It will; it is hardier than clover. The late Mr. John Gore had a field of it at Dorchester nearly twenty years ago; its early, vigorous growth attracted notice; and it endured many years. The writer of this article received a pint of the seed of Lucerne from Florence, under the name of Lupinella, by which it is known in Italy. He sowed it five years ago; not a plant has ever died. His experience enables him to state, that it starts earlier than clover, grows more rapidly. On this day, April 30, 1827, it is nine inches high, and several inches higher than clover by the side of it. It has been cut every year four times; its stalks are not so coarse or woody as

those of clover; its leaves are more numerous; it is eaten greedily by cows and horses, both green and dry. Such is the experience derived from the culture of two rods square only. An half acre has now been sown with it the present year. We shall now proceed with the translation of the Abbe Rozier's article, under the head of Luzerne. France has cultivated this grass for a century at least, and no man could be a better judge of it than this learned agriculturist.

From Rozier's Course of Agriculture.

"OF THE SOIL ADAPTED TO LUZERNE."

"Many authors assert that it succeeds in all sorts of soil. This assertion as a general one is true, but it is very false as a particular one. I have often said in the course of this work, that you may lay it down as a safe rule in agriculture, that the roots of plants will show what sort of soil they require. The root of the Luzerne is (what we call) tap rooted; has few fibres (or small roots) and runs directly down as soon as it finds a soil adapted to it. It is not uncommon to find plants of Luzerne whose roots are six, and sometimes even ten feet long. It is clear from this fact, which I certify to be true, that this plant would not succeed, or would grow poorly in a soil purely stony or sandy; in a strong, clayey, compact soil, or even in a vegetable soil whose thickness does not exceed from six to twelve inches, and which rests upon a basis of gravel or clay. The roots in that case cease to run down, and at the least drought the plant suffers, languishes, and afterwards perishes. The great point is to seek a deep soil. The best soil for it, doubtless, is one that is both light and substantial. Intervale lands have the requisite qualities, rich sandy loams, and generally all lands which are situated at the foot of hills or mountains, because they are constantly enriched by the earth brought down by rains. On the quality of

the soil depends the duration and beauty of the Luzerne. In suitable soils, when none of the accidents to which we shall advert happen to it, it will last in the southern provinces (of France) from ten to twenty years. Its duration diminishes in proportion as the soil is less adapted to it, and sometimes it will not last more than four or five years or even less; in this case it is hardly worth while to sow it, except as an alternate crop, or to restore a field exhausted by over cropping with wheat."

[NOTE.—Though the Abbe Rozier would seem to restrict the culture to the best soils only, yet he admits that other writers contend that it is fitted for any soils; and the land on which we have seen it flourish here is not remarkable for its goodness; any good loam easily penetrated by its roots would suit it; but no doubt, a plant so luxurious in its growth, and with such a quantity of leaves, could not sustain drought on a gravelly or clayey soil.]

Of the choice of seed and the time of sowing.

The seed is usually gathered only from old fields of Lucerne, which are about to be destroyed, and in that case you leave it to dry on the stalk, till the first frosts. As the seed vessel or pod of this plant is in a spiral form, and opens with difficulty, the farmer is not pressed as to the time of thrashing out, or harvesting the seed. In the northern parts of France the grass should not be cut in the year in which it is intended to gather the seed; but in the south of France you may make a crop of early hay, and the second crop will ripen its seeds. [Experience has shown, that we may in America take a first crop of hay, and that the second growth will ripen its seeds in great abundance.] It is very important, that the seeds should be thoroughly ripe, otherwise they will not vegetate. The seeds should acquire a brown colour, or else they will come up thinly, and not cover the ground. When you judge that the seed is ripe enough, you cut it in a dry day, and leave it exposed to the heat of the sun several days running, after

which, it is carried under cover, in order to be thrashed on some dry day in the following winter. I have remarked that the pods open with great difficulty, and that the seeds come out very hardly. You must not then be weary in thrashing it thoroughly, in winnowing it often, and in thrashing that which has been winnowed—in short, it requires patience to separate this seed; of course, the winter, as a season of leisure, is chosen for this purpose. You must take care not to throw the chaff on the dung heap, for many seeds will still remain, and if carried out with the dung will grow and be difficult to eradicate, or destroy. Many authors maintain, that the seeds of this plant are not good for sowing after the first year, but the Abbe de Rozier's experience was to the contrary, though he thinks it safest to sow new seeds, but by no means to throw away old seeds.

Of the proper time of sowing Lucerne.

To point out a precise moment would lead to error. It depends on the climate and the season. In the south of France there are two seasons, one in the course of September, and the other at the end of February, and so on into March, and even later, even till the middle of April. The sowings in September gain one year; the next season following the sowing, you cut the Lucerne like all other grasses; in that case (of fall sowing) the plant flowers later the first year, and you cut but one crop. [In the northern parts of the U. States we cannot sow in autumn; the plants would be winter killed.] Mr. Rozier says, that in the northern parts of France, the sowing must be governed by the season, and may be done as soon as the frosts have ceased, and should not be regulated by Saint's days. We should not be in haste to take a crop, and it is prudent to take but one the first year, in order not to exhaust the plant, and especially to permit it to grow so thick, as to stifle all pernicious weeds. When the Lucerne has once

taken hold in a field, it demands very little care. Some recommend thin sowing in order that the root may have room to send up many stalks. Mr. Rozier on the other hand advises to sow it thick, because all the seeds will not grow, and the strong plants will destroy the weaker ones, but he admits that too thick sowing is injurious. "I think (says Monsieur Rozier), that it will succeed, if sowed with wheat, but I have never tried it." [We know that it will.] —Editors. "We cannot estimate *exactly* the quantity of grain estimated by weight which should be sown on a given space of ground; so much depends on the nature of the soil, and the time of sowing. If sown in September, it should be sown thicker, for it has to encounter ants, birds, and overflowing rains of winter. In spring it has fewer risks to encounter. [In our country, at least, in New England, fall sowing will never answer.]—Editors. You may, however, say, that upon a surface of four hundred square toises [one third of an acre] you ought to sow something more than one sixteenth of a hundred weight, (say seven pounds.) This would be at the rate of twenty one pounds to the acre. If you can procure good seeds from a distant province, the plant will gain by the exchange. The planters in the north of France were for a long time persuaded, that it was absolutely necessary to procure their seed from the south, and they were right, because the plant had not then become acclimated, but at present, these distant transportations do not take place. I am inclined to think, says Rozier, that at this moment it is better to sow northern seed in the south. I repeat it, change of seed is useful in the case of Lucerne, but not as much so as for wheat crops."

[We add, that in Massachusetts, the Lucerne ripens its seeds as freely as clover.]—Editors.

Of the preparation of the land for Lucerne.

At whatever season you sow, the land ought to be ren-

dered very fine by ploughing and harrowing, because all seeds buried under clods will never sprout. If you harrow after each ploughing, the labour will be less. It is not possible to prescribe the number of ploughings, because much depends on the nature of the soil. The nature of the Lucerne root points out the necessity of deep ploughing. The duration and the goodness of a field of Lucerne depends in a great measure, upon the success of the first year; if the seeds do not come up well, if they are sown too thin, weeds will obtain the lead over the grass. If you sow Lucerne in the Spring, two fall ploughings will much facilitate your deep ploughing in the Spring; besides, the earth is admirably divided by the winter frosts. *Winter* is an *excellent labourer*. After the last ploughing, if the furroughs are deep, you must harrow before sowing. Then sow, and harrow; first with the teeth of the harrow down, then with the flat side of the harrow, and so alternately till the seeds are well covered, and it would be well to attach a bush harrow to the harrow with teeth. [In general, these directions do not differ from our usual course in sowing clover and other grass seeds, and the same treatment which is adapted to clover will be proper for Lucerne, except that the ploughing should be as deep as possible.]—EDITORS.

Of the care required for Lucerne fields.

When the soil is adapted to the plant, and it has come up well, it requires no care. This remark does not agree with the assertions of authors, who prescribe *weeding* as necessary to success; a precaution useless, an expense superfluous, if the Lucerne has not been sown too thin. I had scarcely, says the Abbe Rozier, chosen Languedoc as the place of my retreat, than I began to sow Lucerne, and full of the ideas I had before acquired, I caused my fields of Lucerne to be regularly weeded. The peasants smiled at my care and solicitude. I asked them the reason of their ridicule,—the Lucerne, said they, will do more for itself,

than you can do for it; let it alone, it will kill the weeds without your help. For this time they were right; the part of the field which was not weeded, was the next year as good as that which had been. After that, I was not so ready to throw away my money for nothing The Abbe occupies some pages with the destructive effects of an insect, a Scarabæus, something like our rose bug, upon fields of Lucerne, but as we may never be visited with that scourge, we shall omit his remarks on this subject for the present.

Of the different crops of Lucerne [*in the same season.*]

If you give credit to the assertion of an English writer, Mr. Hall, in other respects a writer of great merit, the southern parts of France have the advantage of making even seven crops a year. Unhappily for them it is not true, be the seasons ever so favorable, even when you have water at command and can water your fields at pleasure. If you cut the plant before it is in full flower, you obtain only a watery plant of little substance, and which loses three fourths of its weight in drying. It would, besides, afford but little nourishment. Supposing that the crop should be cut from the beginning to the middle of April, is it possible that the Lucerne should have time to flower seven times in the same season? It is rare, that we can have more than *five crops*. The ordinary number in the provinces, of which Mr. Hall speaks, is four crops. If the season shall have been favourable it is a fine and rich product. No field yields numerically so much as a good Lucerne field. It is a *clear and net revenue for ten years*, which demands no culture, no advance except that of preparing the land for the crop at first; the cost of seed, and the wages of the mowers. One third of an acre, or 400 square toises of Lucerne field, are usually let for one hundred and fifty livres, or thirty dollars a year! Happy the proprietor, who has much land fitted for Lucerne.

Many persons affirm that Lucerne will succeed in any

soil; if this assertion was as true, as it certainly is false, a great part of Provence and Languedoc would be covered with Lucerne, because natural meadows are very scarce in these provinces for want of water, but experience has proved, most decisively, that Lucerne requires a deep soil, not clayey, neither too stiff nor too sandy.

In the central provinces of France, Lucerne is cut three times in ordinary years, and four times in favorable ones; and from two to three times in the northern provinces. It is a general rule that Lucerne should not be cut except when in flower; before that state, it is generally too watery, and its juices crude; after that period, it becomes too dry and too woody. Cattle should not be suffered to feed on Lucerne fields after the last cutting, nor during winter, when the ground is soft. The heads of the plants yield to the hoofs of the cattle, and injure the grass essentially. It is useful to pass a harrow over a field of Lucerne in the spring, and the crop will amply repay the expense of it. Lucerne should be cut in a cool dry time, and tended as rapidly as possible. Rains,—frequent rains while making are very injurious to this grass. Let it be cut under circumstances ever so favorable, and be perfectly dry, it must not be carried in with the dew upon it, nor moved in the very heat of the day, because, in that case it is very apt to lose its leaves, which are the best part. For this reason it should be stirred as little as possible in the middle of the day. Great care should be taken that the hay should be well cured, otherwise it is apt to heat, and even take fire. The first cutting of Lucerne in any season is the least valuable, because it is apt to be mixed with other grasses or plants. The second is the best; the third is usually very good also, but in the fourth and later crops, the juices of the plant are not so rich, and of course are less nutritive.

Of the means of renewing the vigor and growth of Lucerne Fields.

Lucerne fields will wear out in time, but you may retard its period of decline by different treatment and manures. The first, which is the most prompt, convenient and cheap, is to feed your sheep upon it after the last cutting, and even during winter.

Mr. Meyer proposed in 1768, to employ Gypsum or plaster of Paris to revive and recruit old Lucerne fields, and communicated to the œconomical society of Berne, the several experiments he had made. These experiments were repeated by Mr. Kirchburger with care, and the following were the results:

1. That a quantity of calcined plaster, equal in measure, to the quantity of oats which would be required to sow any piece of land, is sufficient to manure it.

2. That gypsum succeeds better on Lucerne fields which are rich, than on those which are poor and sandy.

3. That it produces a greater effect the first than the second year.

4. That it is less active in a moist soil than in a dry one.

5. If you sow the plaster as soon as possible in Spring, the first crop will feel the effects of it.

Mr. the Abbe Rozier adds "I acknowledge according to my own experience, that plaster is very beneficial for Lucerne fields which begin to decline; that it facilitates in a great degree the growth of the large clover; that it is very useful in meadows covered with moss."

The Abbe proceeds to recommend also air-slacked lime, which he prefers to plaster. He notices, and approves a suggestion of the celebrated Duhamel, that when a Lucerne field becomes partially disfurnished by the death of some plants, to supply their place by laying the branches of the adjoining ones, which will take root; but it seems to us that a simpler course, which we have long since adopted

with clover is preferable, which is, every spring to run over the field with a harrow, and throw in fresh seeds in the bare spots.

Of the value of Lucerne as Food.

Lucerne loses some of its value in proportion to its distance from its native soil; that is to say, it is not so nourishing, because its juices are more watery when grown in northern countries. Notwithstanding this no fodder can be compared to it in point of quality; none keeps animals in so high a state of flesh; none augments or increases the quantity of milk so much as Lucerne. These praises in all respects merited, require however some qualifications. Lucerne is heating to animals, and if you do not moderate the quantity in the hot season of the year, and especially in *Southern provinces*, horned cattle will become diseased. If you trust your labourers, they are so proud of seeing their cattle fat, that they stuff them with this food, and are unwilling to believe that it can be the cause of disease. I know of but one mode of preventing the waste of Lucerne by your servants, and labourers, and that is to mix it in equal parts with straw, not in layers, but confusedly and generally mixed. The straw contracts the smell and flavour of the lucerne; the animals eat it with pleasure, and are never injured by it. Lucerne given green to horned cattle or horses, is apt to purge them; for which reason it is a rule never to give it till it has been cut 24 hours. Care also is taken to give it in small quantities at a time, lest they should be hoven. This is not peculiar to Lucerne. The same effects are produced by green wheat, oats, &c. &c. All pasturage which is too succulent is dangerous. In case this accident of being hoven should occur, an expedient which I have tried has never failed, (says the Abbe Rosier) which is to make them swallow an ounce of nitre (salt petre) in a glass of brandy, to empty the bowels of the animal, and to make him run.

We subjoin the two following letters on the same subject to Messrs. Grant Thorburn and Son, New-York, shewing American experience as to the culture and value of Lucerne.

Directions for the Cultivation of Lucerne.

Perth Amboy, New-Jersey, July 10th, 1823.

MESSRS. GRANT THORBURN AND SON,—Having been for eight or ten years in the successful practice of the culture of Lucerne, I think it may beneficially promote the interests of Agriculture, to offer to you a few remarks on that subject. This article (frequently denominated French Clover,) I have found from experience, to be not only the most convenient, but also the most profitable of all grasses. It vegetates quicker in the spring than any other grass; it resists the effects of drought; it may be cut four or five times in the course of a season, and will endure from ten to twelve years without renewing. Of all other grasses, it is the most profitable for soiling. I am fully of opinion, that one acre properly got in, would be more than sufficient to maintain at least six head of cattle, from the first of May until frost sets in; for before it can be cut down in this way, the first part will again be ready for the scythe. English writers have recommended the drill system for this article, but in this climate, I have found this is entirely fallacious. The proper mode is, to have your land properly prepared, to sow the seed broad-cast, and to get it in during the month of April, or in the early part of May. Fall sowing will not answer, for, like clover, when sowed late, it is found not to resist the winter's frost. It may be sowed by itself, or with spring rye, barley, or oats; but in the last case, I would recommend the oats to be cut green, and before getting into seed, by which means, an early feed for cattle may be obtained, and the soil will not be so much (if any impoverished. But the mode I would most confidently recommend, would be to sow with the Lu-

cerne, about half a bushel of common or winter rye. The effect of this is, that the rye, which vegetates quickly, serves as a nurse to the young grass, against the heat of the scorching sun; and by the time the grass attains strength to protect itself, the rye withers and apparently dies. It will, however, come forth in the spring, and mixed with the lucerne, prove a most excellent feed for cattle, and also add much to the quantity of fodder. The rye will admit of being cut green in this way, before getting into seed, two or three times before it decays. The quantity of seed I would recommend to be sowed to the acre, would be from 15 to 20lb. The kind of soil most suitable for this culture, is a dry mellow loam, but a sandy or clay loam will also answer, provided they are not wet. In a favourable season, the lucerne may be cut the ensuing fall after sowing. After the first season, you may generally begin to cut green for cattle by the first of May, which saves your young pastures, and is in every respect a great convenience, as hogs, and every description of animals, devour it with equal avidity. It produces a great quantity of seed, and is much more easily threshed out, than Clover. The second and third crops are the most productive of seed.

Yours, JOHN PATRICK.

Kip's-Bay, near New-York, November 7, 1826.

MESSRS. GRANT THORBURN AND SON,—Last spring, a year ago, you may remember you sold to me one pound of French Clover seed, (Lucerne,) I sowed it (as an experiment) with my oats, in April of the same year. It yielded fine pasture after the oats were cut; and last Spring, when my red clover began to make its appearance, the Lucerne was full three inches above the ground. On the 11th day of May, I began to soil it, daily cutting enough to serve my three horses in my stable, and with very little

help from other grass, I have continued the soiling until this day. My horses have kept in good order through the whole season, and I have not fed them ten bushels of oats, or any other grain, during the whole time. It was richly manured with compost. I mowed it five times notwithstanding the severe drought.

Respectfully, yours, THOMAS STORM.

After having completed the extracts from the Abbe Rozier on Lucerne, we met with an English work, which is still more full on the same subject; and as it would be well to put our readers in possession of so many facts, and of such a variety of authority, as wholly to satisfy their minds of the great value of this grass, we shall insert copious extracts from this English work "the Complete Farmer,"—printed 1793.

Columella, an ancient writer, calls Lucerne the choicest of all fodder, because it will last ten years, and will bear being cut down four, and sometimes six times a year; it enriches the land in which it grows, fattens the cattle fed with it, and is a remedy for sick cattle. Yet notwithstanding it was so much esteemed by the ancients, and hath been cultivated to great advantage in France and Switzerland, for many years, it has not yet found so good a reception in England as it justly deserves; [this was written 34 years ago] nor is it cultivated here in any considerable quantity, though it will succeed as well in this country, as in either of the last mentioned, being extremely hardy, and resisting the severest cold of our climate. [This is as true in Massachusetts: it is hardier than Clover.] Mr. Roque lays it down as a maxim from his *own* practice, that Lucerne will grow on any soil, provided it be not too wet to rot the roots. The strongest land is however to be preferred, and the deeper the soil, the better will be the crop. The land should be prepared in the same manner

as for barley, and brought to a fine tilth. The Lucerne should be sown broad-cast, in fine weather, at the rate of fourteen pounds to the acre. If grain is sown with it, it should only be for half a crop, otherwise it will be apt to destroy the Lucerne, especially if the grain should prove rank; but if no grain is sown with it, the Lucerne will be better. Lucerne may be sown from the beginning of March, to the end of May. If you sow grain with it ever so thin, and it should prove luxuriant, it had better be cut green, lest it should hurt the Lucerne. The grain thus cut may be given to cattle green, or if properly dried will make excellent hay. Lucerne will not grow on newly broken-up land; it must be tilled a year or two; potatoes make the best preparation for Lucerne. In Languedoc they sow no grain with it; but they cut over the Lucerne when it is six inches high, so as to keep down weeds and other plants. In Normandy, whose climate resembles that of England, they sow grain with it. When the plants are a year old it will be proper to go over the ground with a large harrow, to root up annual weeds and grass. The harrow will not hurt the roots of Lucerne, they being very tough; this should be done in dry weather, before the Lucerne begins to sprout, and if there are any patches, where the seed miscarried, you can throw in a little seed upon them. The second year, you may run over your Lucerne with a smooth plough, *without* a coulter, to prevent the roots being too much hurt, and leave it rough a few days, then harrow it smooth. One not used to Lucerne would be apt to think that ploughing would ruin it, but experience shows the contrary. In making it into hay, it should be cut as soon as the bloom appears; it must not be spread like other grass, but lie in the swarth, like Clover, and turned in the same manner, or the leaves, which are most nutritive, will fall off. If suffered to stand too long before mowing, the stalks become too hard for cattle, and it loses much of its goodness. The hay is good for all sorts of cattle, and when

horses are fed with it, they should not have their full allowance of corn; the Lucerne answers, in a great measure, the purpose of both hay and grain. It is also the most profitable fodder to feed horses with in summer by mowing, and giving it to them green. If the land is good, the produce is incredible. Mr. Roque says he has seen it mowed five times in a season, yielding, at the five mowings, eight loads of hay per acre.

As the duration of Lucerne has been a question of dispute, this author quotes the authority of an able cultivator. "As to its duration, it will last as long as the ground is kept clean. I saw some at Mr. Middleman's at Grantham, in his garden, which was forty years old, and it was very fine." The practical cultivator says "It ought not to be cut except when it is in blossom, and that is but three times a year, but after mowing the third crop, instead of cutting a fourth, you may feed it, but when the frosts come you must take your cattle off, because they would bruise the young stalks. If it is rank in September, it is dangerous for cows, it being too feeding [hearty]; but turn horses and sheep upon it. As there is no grass, which has come to our knowledge, which gives the cows so much milk, you may let them graze in the afternoon when the dew is off, about one hour; when made hay it is likewise the best for milk; wherever it is much cultivated they prefer it to all other kinds of hay. When I was in Monosque, a city in Provence, the carriers fed their horses upon it, preferably to any other, without corn; and they were fat and in fine order. It is acknowledged to be the most feeding [hearty?] pasture, either green or in hay. I trust not barely to report, but have found it so myself. Many are apt to condemn it, but it is for want of knowledge. It has been introduced for a long number of years, but so little noticed that 21 years ago, [that is in 1772,] there were not 200 weight of Lucerne seeds to be sold among all the Seedsmen in London, and I had much ado to re-introduce it; but now, [in 1793,] there is a *prodigious consumption* of it."

[Note. The fate of this grass has been the same in the United States. More than twenty years ago, some seeds were imported and succeeded admirably, yet it is only within a few seasons that we have had any for sale; probably the want of regular Seedsmen, and the trouble of importing from France, were among the causes of its slow progress in the United States.]

"Mr. Beadle, a farmer in Kent, has fourteen acres of it, for which he had a premium. When I called upon him in *May* last, he had mowed his Lucerne, and sold it on the spot for three guineas a load. Those that bought this hay must be well acquainted with its goodness to fetch it from the spot, though they lived ten or twelve miles distant. Horses will work with it green, as well as with hay and corn; they do not sweat with it as they do with other green fodder. It is objected, that it is difficult to make; it is no more so than Clover. All hay is difficult to make in wet weather, but if the weather is bad, put it up in ricks when dry, and between every layer strow a little salt, and that will recover all the damage the rain may have done."

Another writer says, "Lucerne should be cut when the stalks are about fifteen or sixteen inches high, on an average; he cut it in three years, sixteen times, or more than five times a year; by the 9th of April, one year, some of the stalks were seventeen inches high, when no field in the neighborhood had grass more than four inches high. The same Lucerne was cut twice before any hay-making began in its neighbourhood."

Mr. Miller, who appears to have cultivated Lucerne with great success, says, that you may cut it in the month of August, the first year, or year of sowing, and feed it afterwards with sheep. It will bear three cuttings and two feedings in a season. Of its capability of resisting cold he gives the following proof:—In the *very cold* winter of 1738–9, he had some roots of Lucerne dug up and laid upon the surface from October to March, when he planted them,

and they shot out vigorously soon after; wet however will destroy the roots. Mr. Miller says, that the most profitable mode of consuming Lucerne, is to cut and give it as green fodder. This is the celebrated Philip Miller, author of the Gardener's Dict.: the most respectable authority that could be quoted. Mr. Chateauvieux of Switzerland, by planting Lucerne in rows obtained at the rate of seven tons and two-thirds of hay from an acre, in five crops in one season. Switzerland is a cold country. Mr. Chateauvieux found, that when the thermometer fell to zero the Lucerne did not suffer. Mr. John Wynn Baker of Ireland, appears to have been very successful in the culture of Lucerne. He says, that in order to ascertain how far Lucerne may be worth the farmer's attention, he made an experiment with an horse, to see how much Lucerne he would eat, so as to learn how many horses an acre of Lucerne would support. The horse he chose was a large one, and had been ploughing all day without food, and he eat forty-nine pounds of Lucerne in the course of the night. Lucerne he says at four cuttings will yield 35840 pounds to an acre. [weighed green no doubt.] This is a low calculation; an acre therefore will maintain at the rate of 49 pounds per day to each, 5 horses for 20 weeks. No natural pasture can do any thing like this; add to this, the profit of making dung all summer.

Mr. Duhamel, the famous naturalist, gives his testimony also in favor of Lucerne; he had forty tons of Lucerne (green) upon an English acre, which he computes at *ten tons* of *hay*. By this remark it would seem that he cut it while in blossom, for Lucerne if cut before it flowers, loses 80 per cent, and therefore his 40 tons would only have produced eight of cured hay. We could much extend these extracts, but we have said enough to induce those, who are convinced as we are by experiment, that it is suited to our climate, to try it extensively.

EXTRACTS FROM A TREATISE ON HORTICULTURE.

By Joseph Hayward, Gent.: London, 1818.

Although much has been written on the subjects of the following extracts, yet the views presented by Mr. Hayward are ingenious, and may be gratifying to many readers. The Aphis is to some plants, and in some seasons most pernicious, and the editors of this Journal can assert, that constant washing with strong soap suds, and even fumigation will sometimes fail to destroy them. We have washed a particular rose-bush once a week for a month, with strong suds thrown on with great force by a garden engine, without full success. Several young apple trees which stood in a remote spot in a distant field, had every shoot wholly destroyed by them. They prevail most in the severity of the drought; the reason of which seems to be, that in wet weather, particularly if cold, they are benumbed, and probably cease to feed and propagate. That part of the extracts which relates to compositions for wounds of trees, is exceedingly amusing to us, who have always laughed at these nostrums, as much as at quack medicines. The truth is, that there are many different compositions radically or essentially different, each of which may answer equally well. Any compost which will adhere and exclude the rain and air from the wound, and *also* prevent the exudation of the sap, will answer all the desired purposes. We have found a mixture of tar, rosin, and yellow ochre or Spanish brown the best we have ever used, but it should be so stiff as not to melt and run down the limb. We had some prejudices against terebinthine, or tarry substances, from a fear, that they would injure the tree, but have found no ill effect in practice. Professor Peck, recommended cheese as an excellent substance for stopping the flow of sap in grapes; we have often experienced its good effects. From some unknown cause, possibly from their being trimmed too late, say in December, all the vines in

a grapery this spring began to bleed, and to such an extent as to threaten their destruction, indeed, so as actually to kill some branches; as the case was pressing, and no cheese at hand, spermaceti was applied with perfect success.

"Although those insects and the caterpillar tribes are very destructive, they are not so great a nuisance to the peach and nectarine tree as the aphis, or plant louse; the sudden appearance and rapid increase of these insects, and which are called blights, most probably gave rise to the belief that they were conveyed by the wind; at any rate, with a superficial observer, this may strengthen the idea; and as with such an impression it would be difficult to induce a person to adopt the only means which I conceive can operate as a remedy, I shall give the following extract from the Encyclopedia Britannica.

" 'The extraordinary nature of these insects have for some time past justly excited the wonder and attention of naturalists. They were long ranked among the animals which had been classed with the true androgynes, spoken of by M. Breyniers, for never having been catched copulating, it was hastily concluded that they multiplied without copulation; this, however, was but a doubt, or at best a mere surmise; but this surmise was believed and adopted by Mr. Reamur, and though he supported it by some observations peculiar to himself, the question remained still undecided, till M. Bonnett seemed to have cleared it up in the affirmative, by taking and shutting up a young aphis, at the instant of its birth, in the most perfect solitude, which yet brought forth in his sight 95 young ones. The same experiment being made on one of the individuals of this family, that had been tried with its chief, the new hermit soon multiplied like its parent, and one of this third generation, in like manner brought up in solitude, proved no less fruitful than the former; repeated experiments in this respect, as far as the fifth or sixth generation, all uniformly

presenting the observer with *fecund virgins*, were communicated to the Royal Academy of Sciences, when an unforeseen and very strange suspicion, imparted by Mr. Trembley to M. Bonnett, engaged him anew in a series of still more painful experiments than the foregoing. In a letter which that celebrated observer wrote to him from the Hague, the 27th January, 1741, he thus expresses himself:—'I formed, since the month of November, the design of rearing several generations of pucerons, (aphides) in order to see if they would all equally bring forth young. In cases so remote from usual circumstances, it is allowed to try all sorts of means, and I argued with myself, who knows but that one copulation may serve for several generations.'—This *who knows*, to be sure, was next to avouching nothing, but as it came from Mr. Trembley, it was sufficient to persuade M. Bonnett that he had not gone far enough in his investigation. If the fecundity of aphides was owing to the secret copulation suggested by Mr. Trembley, this copulation served at least five or more successive generations. M. Bonnett, therefore, reared to the amount of the tenth generation of solitary aphides, and had the patience to keep an account of the days and hours of the births of each generation. In short, it was discovered, that they really are distinguished by sexes; that there are males and females amongst them, whose amours are the least equivocal of any in the world; that the males are produced only in the tenth generation, and are but few in number; that these soon arriving at their full growth, copulate with the females; that the virtue of this copulation serves for ten generations; that all these generations, except the first, (from the fecundated eggs) are produced viviparous, and all the individuals are females, except those of the last generation, among whom, as we have already observed, some males make their appearance, to lay the foundation of a fresh series. These circumstances have been confirmed by other naturalists: in particular we have a curious and accurate detail

of them by Dr. Richardson, of Rippon, in the Philosophical Transactions," an extract of which is given in the Encyclopedia.

Although to a common observer, or gardener, the powers of investigation, as well as patient attention necessary to complete such experiments, may appear too great for them to attempt a demonstration, and perhaps too much to be credited by some, I believe none of them will be able to adduce a proof to the contrary, of what is here stated.

It can scarcely have escaped the observation of any attentive gardener, that during the first part and middle of summer, those insects increase rapidly on the plants where they first appear; and that in the latter part of the summer, a winged and solitary aphis, resembling a small black fly, is seen at the foot of the leaf stalk of the peach tree, where no doubt it deposits its egg on or under the covering of the young bud, and as this increases, it completely shields the egg during winter, and which, (as has been noticed of some of the caterpillar tribe) on the opening of the bud in spring, is exposed to the sun and hatched.

On those parts the aphis is always found to make its first appearance on the peach tree, in the spring; and at this time, although animated, it is scarcely perceptible to the naked eye; its appearance is that of a small black speck, but if closely observed it will be seen to increase very fast in size, and before the blossoms are scarcely opened, to have produced another generation, and those proceed to multiply their numbers in the same rapid manner.

The important fact, therefore, that these creatures, like all others, are the offspring of parents, and engendered and bred on the place assigned for them, cannot be doubted, and their extreme rapidity of increase can only be prevented by an active attention, and application of some effective means of destruction, and which I shall describe.

Washing, brushing, and fumigation, are the methods generally recommended, and in use, but these are seldom

efficacious; for however minute those offspring of the great Creator, they are not without the instinct and power of protecting and defending themselves against common annoyance.

The egg in the first place is deposited so intimately with the embryo bud, that the existence of the one depends on the other, therefore liquids, applied in a natural manner, cannot reach them, and if more forcible means are used, the bud is more readily destroyed than the egg.

When the insect bursts into life, it possesses the means of curling the leaf, or raising the sap in such a manner as to shield and protect itself, and a current of water or air, unless applied with a force sufficient to destroy the object of our care, the bud, it cannot be made effectual.

But although water, smoke, or vapour, cannot be applied so as to come in contact with the insects, in their differently exposed haunts, a fine light powder, like drifted snow, will find its way into their most secluded retreats.

Tobacco dried is poisonous to most insects, and is so obnoxious to the aphis, that whenever it comes in contact with them, they immediately shift their quarters or die; and therefore tobacco in a fine dry powder, or common snuff, blown among the leaves, will find its way into every fold and corner, and by proper and repeated application, will seldom fail to effect a complete extirpation.

The best and most effectual mode of applying snuff, I have found to be by the spiral powder-bellows, or puff, an apparatus which was generally used by the hair dressers half a century back.

It must be observed, that as the eggs escape unhurt, they will after the destruction of one generation produce another; it will therefore be necessary occasionally to repeat the application, and although the tobacco or snuff of itself will not injure the most tender bud or leaf, yet when left with the insects, and their exuviæ, it may form a kind of incrustation, and obstruct its growth; it is therefore best to give

the trees a good washing, two or three days after applying the powder.

This application should not only be adopted as a cure, but as a preventive; therefore during the latter summer months, the powder should be lightly thrown on the young branches, particularly the points of the leading shoots, and it will prevent the moving aphis from distant quarters, from fixing there and forming colonies, or of depositing the eggs for the future year; indeed, if an aphis remains undisturbed a short time only, its bite will prove so venomous as to obstruct the future growth of the branches, and to prevent this in the leading branches is of the utmost importance.

The honey-dew, or excrement of the aphis, often proves injurious to trees, this should therefore be washed off, which may easily be done by throwing soap-suds on and against the leaves, but this should afterwards be washed off with clean water; for when the soap is suffered to dry on the leaves, it proves almost as injurious as the honey-dew.

On the subject of the disease and decay in trees, occasioned by large wounds and fractures, it may be supposed that enough has been said by Messrs. Forsyth and Knight, to lead to a proper understanding and management; but I am inclined to believe, that the public have not been so much benefited by the discovery of Mr. Forsyth, as he had given reason to expect, and even in cases where it might have been beneficial, it has not been much attended to; and this I think has been chiefly occasioned by both his and Mr. Knight's having said more than correct observation and experience could warrant.

I consider it useless to enter into a minute examination of the arguments of those gentlemen, for or against the composition of Mr. Forsyth, and its effects, and shall therefore select one or two short passages only, from the works of each, by way of comparison and a ground of judgment.

Forsyth says, "In the course of more than thirty years'

practice, in cultivating, pruning, and keeping of garden fruit trees, I have observed, that from natural causes, accidents, and unskilful management, they were subject to injuries of different kinds, which always diminished their fertility, and frequently rendered them wholly unproductive. All trees that bear stone fruit, are liable to emit a gum, which by producing a canker proves fatal to the health and vegetation of the trees. Most forest trees are also liable to what is called a bleeding, which proceeds from any injuries that obstruct the circulation of the juices, of those which suffer from bad management or accidents; some are injured by unskilful pruning, and lopping at improper seasons of the year, and others, by the violence of high winds, having boughs or limbs torn from their bodies, which being left in that state, exposed to all the inclemency of hard frosts, are often cracked or rent in the wood; or from heavy and soaking rains, the wounds imbibe so large a quantity of wet and moisture, as by causing a fermentation with the natural juices, brings on disease, and in time destroys the health and vegetation of the tree. These among other causes tend to produce decay and barrenness in fruit trees, as well as defects in timber, to the great loss of the public in general, as well as essential injury to the individual proprietor."

So far these remarks are just; he proceeds, "To remove those evils, and to prevent the ill consequences arising from the causes already described, I submit to the experience of the public, a remedy discovered by myself, which has been applied with never failing success to all kinds of fruit trees, and has not only prevented further decay, but actually restored vegetation, and increased fruitfulness, even in such as were apparently barren and decayed; it has produced also a similar effect on forest trees, by restoring them to soundness of timber, and healthful vegetation, and covering as it were visible nakedness, and increasing decay, with fresh and vigorous foliage. This remedy is a composition,

formerly applied in the form of a plaster, but now in a liquid state, and laid over the wounded or injured part of the tree, with a painter's brush: it is of a soft and healing nature, possesses an absorbent and adhesive quality, and by resisting the force of washing rains, the contraction of nipping frosts, and the effects of a warm sun or drying winds, excludes the pernicious influence of a changeable atmosphere. The discovery of it is the result of much reflection and study during a long course of years, and of a great variety of experiments, made at a very considerable expense, to ascertain the efficacious power of the application, nor shall I hesitate a moment to declare my firm belief, that whenever it shall be properly applied by the proprietors of gardens, orchards, and woods, it will be productive of all the advantage that can be derived from restoring, as well as preserving vigour and fertility in all kinds of fruit trees, and also for preventing decay, and promoting health and sound timber in every species of timber trees, &c."

The first composition is given thus:

"Take one bushel of fresh cow dung, half a bushel of lime rubbish of old buildings (that from the ceilings of rooms is preferable) half a bushel of wood ashes, and a sixteenth part of a bushel of pit or river sand, the three last articles are to be sifted fine before they are mixed; then work them well with a spade, and afterwards with a wooden beater until the stuff is very smooth, like fine plaster, used for the ceilings of rooms; the composition being thus made, care must be taken to prepare the tree properly for its application, by cutting away all the dead, decayed, and injured part, till you come to the fresh sound wood, leaving the surface of the wood very smooth and rounding off the edges of the bark with a draw knife, or other instrument perfectly smooth, which must be particularly attended to; then lay on the plaster, about an eighth of an inch thick, all over the part where the wood or bark has been so cut away, finishing off the edges as thin as possible; then take

a quantity of dry powder of wood ashes, mixed with a sixth part of the same quantity of the ashes of burnt bones, put it into a tin box with holes in the top, and shake the powder on the surface of the plaster till the whole is covered over with it, letting it remain for half an hour to absorb the moisture; then apply more powder, rubbing it on gently with the hand, and repeating the application of the powder till the whole plaster becomes a dry smooth surface. All trees cut down near the ground should have the surface made quite smooth, rounding it off in a small degree as before mentioned; and the dry powder, directed to be used afterwards, should have an equal quantity of powder of alabaster mixed with it, in order the better to resist the drippings of trees and rains."

To the foregoing directions for making and applying the composition, it is necessary to add the following:

"As the best way of using the composition is found by experience to be in a liquid state, it must therefore be reduced to the consistence of pretty thick paint, by mixing it up with a sufficient quantity of urine and soap-suds, and laid on with a painting brush. The powder of wood-ashes and burnt bones is to be applied as before directed, patting it down with the hand.

When trees are become hollow, you must scoop out all the rotten, loose, and dead parts of the trunk till you come to the solid wood, leaving the surface smooth; then cover the hollow, and every part where the canker has been cut out, or branches lopped off, with the composition; and as the edges grow, take care not to let the new wood come in contact with the dead, part of which it may sometimes be necessary to leave, but cut out the old dead wood as the new advances, keeping a hollow between them to allow the new wood room to extend itself, and thereby fill up the cavity, which it will do in time, so as to make, as it were, a new tree. If the cavity be large, you may cut away as much at one operation as will be sufficient for three years; but

in this you are to be guided by the size of the wound and other circumstances. When the new wood, advancing from both sides of the wound, has almost met, cut off the bark from both edges that the solid wood may join, which, if properly managed, it will do, leaving only a slight seam on the back."

On the effect of this composition, he says,

"The first trials of its efficacy were made in some very large and ancient elms, many of which were in a most decayed state, having all their upper parts broken by high winds from their trunks, which were withal so hollow and decayed, that a small portion alone of bark remained alive and sound; of these trees I cut away at first a part only of the rotten stuff from the hollow of the tree, and then applied the plaster to the place where the operation had been performed by way of internal coat of the composition. In a short time, however, the efforts of Nature, with a renovated flow of the juices, were clearly discernible in their formation of the new wood, *uniting with* and swelling as it were from the old, until it became a strong support to that part of the tree where the composition had been applied; I then cut away more of the rotten wood from the inside, applying the plaster in the same manner with the same good effects, and continued to use the knife in proportion to the acquisition of new wood; *so that from the tops of these decayed and naked trunks, stems have actually grown of about thirty feet high in the course of six or seven years from the first application of the composition, an incontrovertible proof of its good effects in restoring decayed vegetation.*

"The acidity or corrosive quality of the juice of oak trees, when obstructed in their circulation, from any of the causes already mentioned, and fermenting with the wet and moisture imbibed by the wounds from the atmosphere, will bring on disease and promote decay; for, notwithstanding the hard texture of the oak, when once the principles of decay begin to operate, the acrimonious juices feed the dis-

ease, and accelerate its progress as much, perhaps, as in trees of a softer quality and texture; but when the diseased or injured part is entirely cut away to the sound fresh wood, and the composition properly laid on, as perfect a cure has been made as I have already related in the recovery of elm trees."

He further says,

"A lime tree about eighteen inches in diameter, whose trunk was decayed and hollow from top to bottom, to which, after cutting out the decayed wood, I had applied the composition, about sixteen years ago, was cut down last year, on purpose to examine the progress it had made in the interior part, and was found entirely filled up with new sound wood, *which had incorporated with what little old wood remained when I first took it in hand.*" And again, "When the wounds in the fruit trees are so large as not to heal up in the course of a twelvemonth, I renew the composition annually, *which on its application invigorates the trees, and seems to have the same effect on them as a top dressing of dung has on land.*"

Mr. Knight, remarking on Mr. Forsyth, says,

"I had however previously examined many trees, to which Mr. Forsyth had applied his composition, in Kensington-gardens, and had observed *that it had not, in any one instance, produced the effects ascribed to it.*"

And, "the examination of the fruit trees in his Majesty's gardens there, perfectly satisfied me *of the total inutility of Mr. Forsyth's composition.*"

Again, "I had invariably answered that I had attentively examined the effect of Mr. Forsyth's composition, when applied to trees of different species; *and that his assertions respecting it were totally unfounded.*"

Now, in these strong and pointed assertions, I cannot but think Mr. Knight has gone too far; most people know that an exposure of wood to the effect of wind and wet, or the general change of weather, facilitates its decay, and that a

covering of paint, &c. retards and prevents it; at any rate it preserves the surface or exterior; and this being the case with wood cut and dried, there cannot be a doubt but, that as Forsyth says, when wounds in growing trees imbibe a large quantity of wet and moisture, it causes a fermentation with the natural juices, which brings on disease and decay, and in time destroys the health and vegetation of the tree; and therefore any covering that can be applied to defend such wounds against these injuries, must operate as a preservative, and promote the health and natural growth of the tree.

It is well known that the wood of trees is formed by annual layers of sap, which first encircles the pith, and then by protruding itself between the bark, which proportionally expands, and the last year's layer or circle of wood, it gradually concretes or becomes wood: this is continued during the summer, and forms the periodical addition.

Whenever a tree is wounded by a part of the bark being removed, or a limb or branch amputated, the sap pushes out all around the wound during the season of its flow, and annually extends itself, by sliding over the old surface until it meets, when, if not obstructed, it unites; and afterwards the annual increase, or layer of wood is formed, in uninterrupted circles, the same as if no wound had been made.

As the flow of sap over an exposed wound may be compared to that of melted tallow poured on a surface, it is obvious that a rugged surface must very much retard, if not wholly prevent, its advance.

In this view Mr. Forsyth's practice of cutting away the obstructing dead wood in hollow trees will appear rational and proper; and when, by decay, the surface of a wound is sunk or hollowed, the extension of the sap is diverted, and prevented meeting and joining; and by its projecting above the wound and round, it forms a lodgment for the rain, and becomes in consequence a vehicle of putrefaction, which extends itself through the tree.

If those observations are correct, although we may not approve the idea of his composition operating as a stimulant, and producing the effects on a tree which a top dressing of dung does on land, or of effecting the incorporation of new wood with the old, we may give Mr. Forsyth the credit of a remedy in its application, for many injuries which Nature, when left to herself, is inevitably exposed to, particularly internal decay from external exposure; but, notwithstanding we admit the efficiency of the composition in this respect, we may consider it as too troublesome and complicated in its preparation, and tedious and filthy in its application, to become of extensive use; and adopting Hitt's recommendation, of applying soot to the diseased part of *apricots*, and observing its effects, it will readily occur that as soot, like charcoal, is a powerful antiseptic and a preventive of the ravages of insects, it might, when mixed with oil, and *rubbed* over a wound, prove also a preservative against putrefaction and the injuries of the weather.

I have long since adopted this application, and found it completely efficacious; a quantity may at all times be readily collected and mixed up, so as to be laid on, like thick paint, with a brush, or rubbed over with a bit of cloth; and as very large wounds will require some years to enable the young wood to close over them, such parts should be covered or painted a second or a third time, at different periods, from six to twelve months, as the rain would otherwise find its way into the little clefts, occasioned by the contraction of the drying wood; and if drying oil, such as linseed, be used, it will prove more lasting and perfect in its effects.

By these means, disease and rottenness will be prevented; the old wood will continue sound and hard, and the surface being preserved smooth, the new wood will form close upon the old wood, and consequently wounds thus treated will never prove so detrimental to timber as when they are left exposed.

It might be observed that the soot, thus applied, will ad-

here to the surface, and, in consequence, the new and old wood cannot unite or incorporate, "but must remain perfectly separate and distinct from each other, without union or adhesion;" this, no doubt, will be the case; and, according to Mr. Knight, this has been explained by Dr. Anderson, as all the effect he believed to be produced by Mr. Forsyth's composition, and all that he or Mr. Forsyth meant to assert it had produced.

There are, no doubt, instances within the scope of every one's observation, of tall, straight, healthy stems growing upon or from old wounded and hollow stumps, without the aid of art; but whenever it is desired to encourage and support the growth of trees in this manner, it is, as Mr. Forsyth observes, more effectually done by reducing all the branches to one, and from time to time removing all other shoots growing from the old trunk, and also all decayed or rotten wood, and applying the covering recommended to the exposed and wounded parts; this, by excluding the air and moisture, will prevent decay and the waste of sap by putrefaction, and the future growth of the tree will consequently be better sustained."

THE SEASON.

Mr. Fessenden,—I certainly should not select the present uncommon season, as a fit one, to suspend my annual account of the progress of vegetation. It is now fourteen years, since I first published such a register, and I have found that it has excited as much notice as a thermometrical journal. I will not say that any important results, any great aid to cultivation may be afforded by it,—neither have I ever yet seen any practical benefit, any essential aid to science from *thermometrical* registers; but they are both of them enter-

taining. When the thermometrical register shall enable us to calculate what weather we shall have in any given space of time in future, the *Journal of Flora*, (as Linnæus called it,) may enable us to know when to sow our seed with security, and how to time our horticultural labours. For myself, I have feeble hopes of any beneficial result, other than a very agreeable amusement.

The present season is one of the very few which transcend or surpass the ordinary limits, on the average of any ten years taken together. It has been said that it is earlier than any year since 1792. This is not strictly true, but it is true, that it has been and is very forward, and its forwardness may be traced clearly to the early and long continued covering of snow. It is a fact within my own knowledge, that plants left in a growing state, when the first snow fell, were found in an equally flourishing state, when the dissolution of the snow, some months afterwards, left them bare. Clover not six weeks old survived the winter, and was ready to start as the snow was dissolved.

REGISTER OF THE SEASONS.

Cherries began to open their flowers,

in 1813	- -	May 10
1815	- -	" 10
1816	- -	" 6
1817	- -	" 6
1818	- -	" 18
1819	- -	" 6
1820	- -	" 2
1821	- -	" 9
1822	- -	" 1
1823	- -	" 7
1824	- -	" 1
1825	- -	April 23
1826	- -	May 4
1827	- -	April 21

Thus it will be seen that the present season was, as it respects the opening of the cherry blossoms, two days earlier than in any year during the last fourteen,—and earlier than the average of the fourteen years, about fourteen days.

THE OPENING OF THE PEACH.

I shall take a smaller number of examples of the other plants, because one plant in effect shows correctly the true state of vegetation:

Peaches in	1815	began to open	May 10
"	1816	"	" 5
"	1825	"	April 25
"	1827	"	" 16

Apples opened their flowers,

in	1813	- -	May 23
	1815	- -	" 18
	1825	(*the earliest year before the present, for fourteen years*)	

Siberian crab apple began to flower May 7
Ditto, in 1827 - " 4

Other early apples opened,

in	1825	- -	May 8
in	1827	- -	May 4

These are the general facts as to large plants not easily affected by casual causes. The present is the most early season known, as to such plants within the last fourteen. The same remark may be made as to herbaceous plants. *Asparagus* was cut in the same bed this year ten days earlier than in any year (except 1825) since the register was kept. It is equally true as to grass. It is from ten days to a fortnight more forward than usual. We have however had six days together so cold that asparagus did not grow one inch during the whole period. As yet, we have es-

caped frosts except *one severe* one. This does not appear to have affected any of the fruits. *Peaches* never promised better. *Pears* do not *generally* promise well. The *Apple* blow will be of course less than that of last year in those sorts of trees which flower biennially. Those which had full crops of Rhode Island greenings and Baldwins last year, will not have a single blossom this; for this reason we prefer the Spitzenburg, and other apples, which bear moderately every year.

These remarks apply only to my own garden.—No man can be accurate, as to the condition of his neighbours' fruits. Generally speaking, however, it may be presumed that the state of one garden will give a fair average of the whole.

A FARMER.

N. B. I have said, that apple trees which bear moderately every year, are preferable to those which bear *one* year very full, and the next year not one apple. Too little attention is paid to this difference by the farmer. The apples which bear constantly are the Newtown pippin, Prince's pippin, Esopus Spitzenburg, the Russeting, the Bell flower, &c.—*New-England Farmer.*

Roxbury, May 27, 1827.

[Since the foregoing statement of the season was published, the progress of vegetation has continued with the same proportionable advancement over ordinary years. Grass will be ready for the scythe at least seven days earlier than usual, that is, the poa pratensis, Dutch clover and May grass, are at this moment seven days more forward than usual.

The sweet scented vernal grass is nearly out of flower, and the May grass, or Aloepecurus pratensis, or Meadow Foxtail of the English, and also the Ribwort or field plain-

tain (a very common grass in many soils) are now in the fullest blow. I wish I could add, that the prospect for Peaches continued to be as good as when the above remarks were made. *Young* peach trees, with me, have undergone a very material change; the flower buds have nearly all fallen, in some instances all. The foliage has been sickly, and the ground is strewed with yellow leaves; this I attribute not to frost, but to long continued rains and cold easterly winds. The change did not take place until three weeks after the only frost we had, and every part of the flower and shoots continued during that time to flourish as well as ever. Frost does not turn the leaves yellow, and curl them up; its effects are seen the first day, if at all;—as soon indeed as the sun strikes upon them. Now whatever destroyed the foliage would destroy the germ; indeed the sickly state of the foliage would of itself prove fatal to the fruit in its embryo state. The severe frost with me was on the 28th of April, and my peaches went on to flourish till the 15th of May. This general fall of the first leaves, and in some cases destruction of the shoots themselves, was not owing to disease in the tree; mine have no worms; are not gummy, and have now shot anew with great vigour. Nor were the effects of the cold north-east storms and superabundance of rains confined to the peach; they have been nearly as fatal to the early blowing cherries, to the leaves of some pear trees, to asparagus while that weather lasted; and the same cause has wholly destroyed my crop of gooseberries. We ought not to complain however. The crops of grass will be abundant; potatoes look finely. Strawberries flourish in such weather, and will be very fine. Peaches (notwithstanding the young trees have suffered) will yield a great crop, and I feel persuaded will be more plenty than the cultivators will wish.

A FARMER.

[We are induced to republish the following extract from the American Farmer, not only because we know of no grass superior to the Meadow Foxtail, but on account of the very curious and interesting remark as to the comparative value of the first crop and *aftermath* of the Meadow Foxtail; it is stated that the value of the after crop of that grass is superior to the first crop as 4 to 3: and the superior productiveness or value of the after crop of the sweet scented vernal grass to its first crop as 9 to 8. This may account for a fact stated by us in a Review of Judge Buel's Essay on Grasses, published in our last number, viz.: the great productiveness of a meadow, in which the sweet scented vernal grass, and the Meadow Foxtail prevail.—The Meadow Foxtail has never been cultivated in our neighbourhood, yet it abounds in our meadows chiefly on the outskirts of wet lands; it delights in a soil moist, but not wet. I have a field now in sight, as I am writing, in which seven-eighths of the whole herbage is the May grass, or Meadow Foxtail. It is now in blossom, and will be cut in a week; it will yield two abundant crops afterwards. It would be well worth sowing in moist land not too wet; but how can we get the seeds?]

ON GRASSES AND OTHER PLANTS.

Extracts from G. Sinclair's Hortus Gramineus—with occasional notes and observations, by a Correspondent.

"ALOPECURUS *pratensis*. Meadow fox-tail grass.*

"*Specific Character*—Stem erect, smooth; spike somewhat panicled; calyx-glumes acute, hairy, combined at the base, shorter than the awn of the corolla. Sm. Engl. Fl. i. p. 79. Native of Britain and most parts of Europe, from Italy, through France, Germany, Holland, to Denmark, Norway, Sweden, and Russia.

"The proportional value of the grass of the latter-math to that at the time of flowering, is as 4 to 3; and the crop, at the time the seed is ripe, is to that of the latter-math as 9 to 8.

"Experiments clearly shew that there is nearly three-fourths of produce greater from a clayey loam than from a siliceous sandy soil, and that the grass from the latter soil is of comparatively less value, in the proportion of 3 to 2.

* This must be carefully distinguished from the plant usually called *Fox-tail grass*, in many parts of the United States. Our Fox-tail grass is the *Setaria glauca*, or *Panicum glaucum* of the botanists; and is rather a worthless, weed-like grass.

The culms produced on the sandy soil are deficient in number, and in every respect smaller than those from the clayey loam; which satisfactorily accounts for the difference in the quantity of nutritive matter afforded by equal quantities of the grass. It is not the strength and rankness of the grass that indicates the fitness of the soil for its growth, but the number and quality of the culms. The proportional value in which the grass of the latter-math exceeds that of the flowering crop, is as 4 to 3; a difference which appears extraordinary, when the quantity of flowering culms in the flowering crop is considered. In the *Anthoxanthum odoratum* the proportional difference is still greater, the latter-math being to the flowering crop in nutriment nearly as 9 to 4. In the *Poa trivialis* they are equal; but in all the later flowering grasses that have culms resembling those of the meadow fox-tail and sweet scented vernal, the greater proportional value is always, on the contrary, found in the grass of the flowering crop. Whatever the cause may be, it is evident that the loss sustained by taking these grasses at the time of flowering, is considerable. In ordinary cases this seldom happens in practice, because these grasses perfect their seed about the season when hay-harvest generally commences, unless where the pasture has been stocked till a late period in the spring, which cannot in this respect be productive of any ultimate advantage, but rather loss. This grass, under the best management, does not attain to its fullest productive powers from seed till four years; hence it is inferior to the cock's-foot grass for the purposes of alternate cropping, and to many other grasses besides. The herbage, however, contains more nutritive matter than that of the cock's-foot, though the weight of grass produced in one season is considerably less. It thrives well under irrigation, keeping possession of the crowns of the ridges: it is strictly permanent. Sheep are very fond of it: when combined with white clover only, the second season, on a sandy loam, it is sufficient for the support of five couple of ewes and lambs per acre. As it only thrives in

perfection on lands of an intermediate quality as to moisture and dryness, and also being somewhat longer in attaining to its full productive state than some other grasses, its merits have been misunderstood in many instances; and in others, as in the alternate husbandry, it has been by some persons set aside altogether. In many rich natural pastures it constitutes the principal grass. Though not so well adapted, therefore, for the alternate husbandry, it is one of the best grasses for permanent pasture, and should never form a less proportion than one-eighth of any mixture of different grasses prepared for that purpose: its merits demand this, whether with respect to early growth, produce, nutritive qualities, or permanency. It has been observed by the Rev. Mr. Swayne,* that nearly two-thirds of the seed is constantly destroyed by insects: according to my experiments this evil may be almost entirely obviated by suffering the first culms of the season to carry the seed. It flowers in April, May, and June, according as it may have been depastured earlier or later. Seed ripe in June and July, according to the season of flowering."

This grass is very little known in the United States; and, it is believed, has not yet been cultivated—though it may possibly be worthy of being introduced.

ON RAIL ROADS.

[We know of no topic, which can be more interesting to Farmers, at least, no one which well understood, *ought* to be more interesting to them than rail roads. We know of no publication in which information on this subject could be more properly conveyed or more usefully disseminated than in this journal. To the farmer it is a much more important question than in what manner he can increase his crops; he can scarcely hope to increase them more than 50 per cent.; but by cheapening and facilitating transport,

* See *Gramina Pascua*, by the Rev. George Swayne—a work which contains much valuable information on the subject of grasses.

the value of produce may in some instances be trebled, and in others, a value, a great value may be given to productions of art and nature, which without such facilities would be of no value whatever. We speak not from theory, but from the experience of Great Britain and of our own country. Coal mines in various parts of England were known to exist, but were not worth the expense of opening, until canals were introduced, and they are now the sources of immense individual and national wealth. The great canal of the Duke of Bridgwater was dug solely or principally to convey coals, and it made its enterprising projector or his representatives the richest subjects in Great Britain. The wheat of the Genesee Country was instantly raised by the Erie Canal 150 per cent. in value. To canals, however, in our country there are objections, which do not apply to rail roads. We have always doubted the expediency of a canal even to Connecticut river. It would require so great a number of locks and the consequent delay would be so great, and the expense of tolls and horses so heavy, that we doubt whether a canal would ever compete with the sloop navigation of the river. It is not our intention to enter into the argument in favor of rail roads. This has been very ably discussed by Nathan Hale, Esq., a gentleman, in all respects qualified for the investigation of such a question.

It is well known, that a project for a rail road much more extensive, and in many particulars far more difficult than the execution of one from Boston to the Hudson river has been formed in Baltimore; that an act of incorporation has been obtained; that the subscriptions far exceeded the amount required by the estimates; that they were made by men of great judgment, experience, and wealth; a highly respectable committee was appointed by the subscribers to consider and report on the subject, and they have submitted their report to the proprietors. This report has not been printed at large in this State, and at this moment while the question is under discussion, we think we cannot render a more acceptable service than to give the sketch of that

report as it appeared in the American Farmer, edited by J. S. Skinner, Esq., in Baltimore. It should, however, be kept in mind, that the surveys have not yet been made in Maryland, and of course the calculations cannot be rigorously exact.]

BALTIMORE AND OHIO RAIL-ROAD.

Historical sketch of the contemplated Rail-road from Baltimore to the Ohio.

Though we shall not have room to record *in extenso*, all the documents which will be put forth in the progress of the investigation which has been commenced in regard to this great project; we hold it to be our duty to give, from time to time, a sketch of the measures which may be taken in relation to it, to serve as a history of the undertaking, whether it be destined to succeed, or to miscarry. We commence accordingly, now, with the meeting of the citizens of Baltimore, on the 12th February, 1827; and we set apart a few columns for this sketch the more cheerfully, as we hope the facts and illustrations adduced by the committee, independently of their application to this particular work, will throw light upon the general subject that will be acceptable to the general reader, and useful to those who may be charged with enterprizes of a similar character, on whatever scale, in other parts of our widely extended country.

The meeting was convened to consider of the best means of "restoring to the city of Baltimore the portion of the western trade which has lately been diverted from it by the introduction of steam navigation, and by other causes."

William Patterson, Esq. one of our oldest merchants, of great probity and large fortune, and a whig of the revolution, was appointed chairman of the meeting, and David Winchester, Esq., secretary. Many documents and statements were produced at the meeting, to show the advantage of RAIL-ROADS over turnpike roads or canals, for transpor-

tation of heavy articles of carriage. These documents were referred by the meeting to a committee, with instructions to examine and report thereon to a subsequent meeting.

The committee so appointed consisted of—P. E. Thomas, Benjamin C. Howard, George Brown, Talbot Jones, Joseph W. Patterson, Evan Thomas, and John V. L. McMahon.

A resolution was then proposed by the meeting to contribute each ten dollars, to be placed at the disposal of the committee, who were invested with power to receive subscriptions from others. The meeting then adjourned to convene again on the 19th of February, 1827. A meeting was accordingly held pursuant to said adjournment, when the committee appointed at the previous meeting presented their Report. Of this Report, we must content ourselves with giving a brief outline. The prominent points are these:

That if Baltimore remain longer inactive, she must yield to the more efficient exertions of New-York and Philadelphia the little that remains to her of the western trade. In regard to the Susquehanna, the committee despatch it by remarking, that "The effort now making to connect the tide water of the Susquehanna by means of a canal navigation with the eastern extremity of the Pennsylvania State Canal, it is confidently hoped, by the friends of that measure, will secure to us the ascending and descending trade of this noble river, and perhaps will lead hereafter to a direct water communication with the great northern lakes, with whose tributary streams the Susquehanna interlocks. In completing this measure, we shall therefore do all that we are now called upon to execute in reference to the river Susquehanna."

After setting out the fact that Baltimore is nearer than New York by 200 miles, and nearer than Philadelphia by 100 miles, to the navigable waters of the west, the committee proceed to speak of the various modes which have been devised for intercommunication between distant points.

"When Turnpike roads," say they, "were first attempted

in England, they were almost universally opposed by the great body of the people, a few enterprising citizens however succeeded after a severe struggle, in constructing them. The amount of travelling was then so limited, that this means of transportation was found abundantly sufficient for all the exigencies of the then trade of that country; in a little time however, so great was the increase of commerce there, (and which increase in a great measure resulted from the advantages these roads afforded) that even the turnpikes in a short time were found insufficient to accommodate the growing trade of the country, and the substitution of canals in the place of roads was the consequence, in every situation where the construction of them was practicable.

"It was soon ascertained, that in proportion to the increased facilities afforded to trade by the canals in England, was the increase of trade itself, until even this means of communication was actually, in many of the more commercial parts of the country, found insufficient for the transportation required.

"Rail roads had, upon a limited scale, been used in several places in England and Wales for a number of years, and had, in every instance, been found fully to answer the purposes required, as far as the experiment had been made. The idea of applying them upon *a more extended* scale, appears, however, only recently to have been suggested in that country; but notwithstanding so little time has elapsed since the attempt was first made, yet we find that so decided have been their advantages over turnpike roads, and even over canals, that already 2000 miles of them are actually completed or in a train of rapid progress, in Great Britain, and that the experiment of their construction has not in one case failed, nor has there been one instance in which they have not fully answered the most sanguine expectations of their projectors. Indeed, so completely has this improvement succeeded in England, that it is the opinion of many judicious and practical men, there, that these roads

will, for heavy transportation, supersede canals as effectually as canals have superseded turnpike roads.

"We would just here remark, that the canal system has many advantages in England which it does not possess in this country.

"1st. The climate in England is so much milder in winter than ours, that their canals, even as far north as Liverpool, are seldom frozen, and then only about a week in any winter, whereas they would be often frozen up here for many weeks, and sometimes for several months.

"2dly. From that country having been long opened and cleared, the people there now know the minimum volume of their streams, and of course can calculate exactly how far they can depend upon these streams for a supply of water for their canals: whereas, with us it is known, that as the country is cleared, our streams are every year diminishing, and no one can now pretend to say to what point of declension they may yet go; but it has already been ascertained that 30 or 40 years back, many of them contained double the quantity of water they now do, in the latter part of summer.

"Thirdly, the climate of England being above the fiftieth degree of latitude, the people there have nothing to fear from the stagnation of water in their canals, whereas our climate is at least four months in the year a tropical one; and it is found by universal experience, that the exhalations from a common mill-race, renders the air unwholesome for a considerable distance on both sides of it. There is reason then to fear, that the same objection would apply to the navigating a canal below the fortieth degree of latitude, during the hot season of the year, that is found to exist against navigating the river Mississippi to New-Orleans. We say then, if England, with these decided advantages, which she undoubtedly possesses over us in favor of canal navigation, is about to supersede her canals by the construction of rail-roads, will it be wise in us to exhaust our

resources upon a system which is now about to be abandoned in a country where the experiment of the two plans has been fairly and fully made? There has yet in this country, been but one rail-road constructed and fully tested, and this is only about three miles long; it cost $11,000 per mile; but it is alleged that, with the experience now gained, a similar one could be constructed for about one third less. We here refer to the Quincy rail-road near Boston. It was erected as an experiment, and as far as it has been tried, has fully answered the expectations of the parties for whose use it was made; not having been the least injured by the severe frosts during the late winter.

"The stock of information upon the general subject of rail-roads, now in possession of this committee, is admitted not to be very extensive, but they have gleaned from the several publications and reports which they have examined upon this interesting subject, enough to leave no doubt upon their minds, that these roads are far better adapted to our situation and circumstances, than a canal across the mountains would be: they therefore recommend that measures be taken to construct a double rail-road between the city of Baltimore and some suitable point on the Ohio river, by the most eligible and direct route, and that a charter to incorporate a company to execute this work be obtained as early as possible; and in support of this opinion, they submit the following views and statements."

"Where an intermediate space between any two places, at a considerable distance apart, admits of being made so nearly horizontal as not to deviate more than 27 feet 6 inches a mile, locomotive engines may be employed [upon rail-ways,] to great advantage. Upon the Hetton road at Sunderland, 7½ miles in length, these engines draw 24 chalder wagons in a train, at the rate of four miles an hour. The weight, including the wagons, being equal to 90 tons." —*Strickland's Report, p.* 27.

"A high pressure locomotive engine, working with two

8-inch cylinders, and weighing five tons, has drawn on a level 27 wagons, weighing 94 tons, at the rate of four miles an hour; and when lightly laden, it will travel ten miles an hour. The cost of one of these engines is 400*l.* stg."—*Idem, p.* 29.

"The introduction of the locomotive engine, has *greatly changed the relative value of rail-ways and canals;* and where a communication is to be made between places of a commercial or manufacturing character, which maintain a constant intercourse, and where rapidity of transit becomes important, *it cannot be doubted that rail-ways will receive a preference in consequence of this very powerful auxiliary.*"—*Idem, p.* 31.

"A rail-way is equally suited to a mountainous or level country, and either horses or locomotive engines may be used upon it, (though not with advantage at the same time, from their difference of velocity,) the wagons being drawn along by the locomotive engine, which derives its motion from the contact and friction of the wheels against the rails, the wheels being attached directly to the steam engine. Where a rail-way is level, the power required to move the wagons is little more than the friction, which is found to amount to about a 200th part of the weight to be conveyed; or in other words, a power of one pound applied in the direction of the motion, will draw forward 200 lbs."

"A locomotive engine of ten horse power, will draw 120 tons, at the rate a draught horse travels; or 50 tons at the rate of six miles an hour. The engine requires the attendance of only a man and a boy, at a daily expense of five shillings. The coals consumed in ten hours would be from 20 to 30 cwt.; therefore the expense altogether would be less than 30 shillings per day—for which 50 tons may be conveyed 60 miles in ten hours, which is less than half a farthing a ton per mile."

"It is to be remarked that the rate of travelling may be increased to surpass that of mail coaches; and that the locomotive engine will as readily convey 25 tons (including

its own weight,) at the rate of twelve miles an hour, as double the weight in twice the time."

"Where ascents and descents were unavoidable, they were obviated by the introduction of inclined planes, up which the loaded wagons were drawn by stationary engines, or the loaded wagons descending, drew up the empty ones. Their present degree of perfection has thus been gradually attained, and four or five years' experience has fully proved their simplicity, cheapness, and regularity." *Idem, p.* 32.

"The cost of a double rail-way from Cromford to the Peak Forest Canal, in which there is a tunnel, four inclined planes, and including engines, warehouses, cost of lands, &c. &c. is estimated at £149,000. The distance, eleven miles. A canal to form the same connection, as estimated by Rennie, would cost £650,000. The construction of a double rail-way from Whaley Bridge, (a distance of thirty miles,) including bridges, tunnels, culverts, towpath, land purchased, warehouses to be erected, and all other expenses, was estimated to cost £4310 per mile."—*Idem*, p. 33.

"Upon a rail-road near Newcastle, a locomotive engine in fifty-four weeks, conveyed 53,823 carriages of coals, each weighing 9488 lbs., 2541 yards, and returned with the same number of empty carriages, each weighing 3472 lbs. This was in 54 successive weeks; and in that time, exclusive of Sundays, the engine, from want of goods to convey, was at least twenty days off work; so that in 304 days, the performance was 446,815 tons conveyed one mile, or 1470 tons, one mile each day; on a stage only 2541 yards. This engine had three feet wheels, which were calculated for a rate of about 4½ miles per hour; with *larger* wheels, and when the distance to be traversed is greater, the difference of effective speed between the horses and locomotive engines, will be correspondingly increased." —*Wood, on Rail-ways, p.* 281.

In addition to the foregoing evidence of the superior ad-

vantages of rail-ways over canals, furnished by Strickland and Wood, the committee submit the following extracts from a very valuable treatise, entitled "Observations on a General Iron Rail-way or Land Steam Conveyance," by Thomas Gray; and in proof of the high value in which this work is held in England, the committee need only remark, that in a very short time it has passed through five editions, from the last of which these extracts are made.

"The experience already had of our canal conveyance, cannot fail to convince every reader, after due observation, that the heavy expense attending the construction and repair of canal boats, with all their multifarious tackle, men's wages, horses and their keep, must render the transport much dearer than by a rail-way, which so peculiarly combines both economy of time and labor; and the few hands required to superintend a gang of wagons on the rail-way, compared with those employed in the conveyance of the same freight by a canal."—*Gray, p.* 36.

"The enormous expenses so peculiar to shipping, and the further detentions by canals, (such as the total stoppage to commerce when they are undergoing repair, and in time of floods, or frosts, or droughts,) greatly retard the intercourse of the country, and consequently enhance the transport of merchandise: on all these points I refer my readers to the merchants and traders, who cannot forbear their testimony in support of this statement. Rail-ways are free from all these objections, and the great speed with which journeys might be made, would enable coach and wagon proprietors to reduce the present rate of carriage one half." —*Gray, p.* 41.

"All counties, which from their distance and expense of carriage, are totally denied the use of coals, might, by means of the plan now under consideration, be regularly supplied with this necessary article of fuel, on terms nearly equal with those situated in the more immediate neighborhood of coal pits."—*Gray, p.* 46.

"The proprietors of the *few* canals which do answer, will have the greatest reason to complain; but they, in common with the rest of society, must of course submit to any superior method of improving the conveyance or transport of merchandise, just as the common coasting traders will to the established steam vessels. With respect to those canals which do not answer, and those that never can, the sooner they are abolished in toto, the better."—*Gray, p.* 66.

"The expense of forming rail-ways is not only far less than that of canals, but the former exhibit the peculiar advantage of a better conveyance than roads and canals conjointly afford at present."—*Gray, p.* 67.

"The mode of conveyance that most nearly assimilates to rail-ways, is canals; but to them, the agency of steam cannot be available, as they are limited to the size of their loads, and as regards utility, to the speed of conveyance; for to draw a load of forty or fifty tons with double the speed that is now done by one horse, could not be effected on a common canal by any power that can be applied.—*Jessop, in Gray, p.* 103.

"A rail-way can, according to circumstances, be made at from a half to a fourth of the expense of a canal, and convey goods more cheaply, which would render them lucrative when any other mode would be ruinous."—*Idem, in Gray, p.* 104.

"On the proposed rail-way, where the ascent from Cromford by four inclined planes is nearly 1000 feet, and the descent to the Peak Forest canal between 7 and 800 feet, by three others, the average cost of working each place will be about a halfpenny per ton. When these very moderate expenses of carriage are considered, it furnishes an additional argument in favor of the opinion I expressed in my former report, that a rail-way forming so important a connection between rich and populous districts, and with canals which yield an abundant revenue, cannot be a spe-

culation of hazard; but must be a secure and a lucrative mode of investing capital."—*Idem, in Gray, pp.* 107–8.

"Rail-ways have latterly been extensively constructed from the collieries in the neighborhood of Newcastle, and experience has confirmed the advantages above stated, and the simplicity attending them: they obviate many objections to canals, arising from the localities of the country. When great elevations have to be passed over, the lockage on canals is excessive, and the consequent supply of water expensive, and perhaps only to be obtained by interfering with the vested rights of mill owners."

"Rail-ways may be constructed at one-fifth part of the expense of canals; and as it has been shewn that they will convey as cheaply, where the prospect of remuneration to the adventurer in one case is doubtful, the lesser expense makes the other certain; and as few persons have the public spirit to embark in unprofitable speculations, the lesser cost of a rail-way may secure to a district the advantage of cheap conveyance of the first necessaries of life, as well as give value to its mines and produce, and to the public that of free communication with distant places, whilst benefit to the adventurers is not lost sight of. Canals take the richest land, and are circuitous by following the valleys, and the carriage from them is ascending. Rail-ways may pass along the tops and sides of hills from whence the carriage of coals and heavy goods will be conveyed into the neighborhood without the obstacles of hills, and their elevation admits of branches from them at little expense, wherever mines or a populous village make it desirable."—*Gray, p.* 180–181.

"Rail-roads, as hitherto worked by horses, possess very little, if any advantage, over canals; but rail-roads, worked by the locomotive steam engine, have so decided a superiority, both as regards time and expense, that there can be no question, but they will be generally adopted, wherever a new line of conveyance has become necessary, either

from an increased trade, or from the exorbitant demand of canal proprietors. By the locomotive engine, 50 tons of goods may be conveyed by a ten horse power engine, on a level road, at the rate of six miles an hour, and lighter weights at a proportionate increase of speed. Carriages for the conveyance of passengers, at the rate of 12 or 14 miles per hour. For canals, it is necessary to have a dead level; but not so for rail-roads: an engine will work goods over an elevation of one eighth of an inch to the yard. Where the ascent or descent is rapid, and cannot be counteracted by cuttings or embankments, recourse must be had to permanent engines and inclined planes, just as recourse is had to locks for canals; but here again the rail-road system has a great advantage—the inclined plane causes no delay, while locking creates a great deal."—*Gray, p.* 185–186.

"When the rail-way is once completed, the repairs would not be so heavy as on the common turnpike roads, owing to the very good and very substantial foundation which must be laid to begin with."—*Gray, p.* 4.

"The carriage of oysters renders them so excessively dear in towns remote from the metropolis, that in order to have one small barrel forwarded to any friends residing two hundred miles in the country, an additional charge of 50 per cent. or more, on the cost, is made for carriage; this evil would be obviated by the plan now submitted to the public, as proprietors of steam wagons and caravans would be able to deliver merchandise 2 or 300 miles (indeed any distance wherever the rail-way extends) within the time now required for coaches; and the great quantity taken with such ease and rapidity, would cause the carriage to be only one quarter of the present charge. As almost every one would gladly partake of oysters during the season, this general wish might be gratified by the great reduction in the price of carriage, and at the same time prove highly advantageous to the owners of oyster

beds. All perishable articles, such as fish, fruit, and provisions of ordinary and general consumption, require a speedy conveyance, otherwise they soon spoil from the heat occasioned by any quantity being packed together; therefore, the same vehicles which take the fish, as already mentioned, will afford every necessary means required, and cause a general and uniform supply of these articles of food."*—*Gray, p.* 30–31.

An abstract statement of the comparative difference between Horse and Mechanic Power.

The real number of wagon, coach, and post chaise horses, employed on our main turnpike roads, will, perhaps, be found to exceed 500,000; taking, however, this number for a calculation, and computing the value of each horse at *l.*20—the keep at *l.*20 each per annum; in the course of 12 years, allowing for the renewal of stock every four years, and the interest of capital, the consequent expense in this limited space of time, is - - -	*l.*173,500,000 0 0
The expenses of 10,000 steam engines, *l.*300 each in value, which would, on a rail-way, be more than equivalent to the horse power, above stated, amounts to *l.*3,000,000 0 0	
Interest of this capital for 12 years, 1,800,000 0 0	

* Should the result here stated be realized in reference to the proposed rail-road from Baltimore to the Ohio river, an extensive market would at once be opened to the West, for fish and oysters, which must necessarily increase the value of our numerous fisheries and oyster beds, upon the shores of the Chesapeake Bay, to an enormous extent, besides sustaining an immense augmentation of the tonnage on this Bay and its tributary waters; thus opening to the people who reside upon these shores, or who hold property near to them, a new and highly lucrative source of wealth.

The fuel necessary to feed the steam engines, taken at 14*s.* per day for each engine, in 12 years amounts to	30,660,000 0 0—	*l.*35,460,000 0 0
Difference in favour of the rail road system,		*l.*135,040,000 0 0

Gray, p. 67.

The Committee are much gratified to find themselves fully sustained in the opinion they have here endeavoured to enforce, of the superiority of a rail road over any other means of communication between the city of Baltimore and the Western states, by a very able report, lately made by a Committee of the Legislature of Massachusetts, who it appears had been appointed to ascertain the most eligible means of opening a direct inland communication between Boston and the Hudson river at Albany. The district of country between those places being in many respects similar to that between us and the Ohio river, renders this report the more interesting to us: The Committee therefore take leave to offer the following extracts from it:

"The Committee of the Massachusetts Legislature after reviewing the two means of intercommunication which have been most thought of, levels and rail-ways, and after a candid examination of the advantages, expense, &c. of each, come to the conclusion that the latter is preferable. The first cost of an iron rail-way, with two sets of tracks, is less than that of a canal, and the expense of repairs essentially less. The cost of the Quincy rail-way is stated at $11,052 98 a mile, which is believed to be a third more than a like undertaking would now cost."

This Committee then proceed to state that: "The nu-

merous rail-ways which have been for several years in successful operation in the hilly and mountainous districts of Wales, and in the north of England, prove their fitness to an uneven and undulating country.* They are not like canals, confined to a supply of water, and series of levels, but they admit of a variation like other roads. True, a level road, where the transportation is equal both ways is the best. But unless the deviation generally exceeds 27½ feet to a mile, it is, practicably considered, a level way. This deviation is nearly equal to three and a half locks on a mile of canal.

"The best material for constructing a rail-way, except iron, can be obtained on and near any route which may be selected. Our state abounds with immense quarries of granite, gneiss, and other hard rocks suitable for such a work; and in many places these may be had with little or no expense except the labour necessary for the preparation.

"Mines of iron are found in many parts of the state; and much of that important article can be had in this and the adjoining states. The prospect of such a demand for iron, as a resolve to construct a rail-way would produce, would naturally increase the manufacture, as well as the importation of that article.

"The rivers and other streams of water to be passed by the proposed rail road, are not such as to afford any serious difficulty. Bridges can be constructed, differing little in their form, except the rails, from those in common use.

"Your Committee are aware that the face of the coun-

* In support of this opinion, the Committee might further state, that the United States' Engineers in their report to Congress herein referred to, have, in consideration of the obvious difficulty of constructing a canal across the Alleghany mountains, suggested to the government, "the expediency of making the surveys and investigations necessary to ascertain as accurately as practicable, the comparative merits of a rail road and canal for the section of route from Cumberland to the mouth of Casselman's river."

Report U. States Engineers, p. 64.

try as above described, seems to present serious obstacles to the proposed design. But these obstacles lose much of their apparent magnitude when the *construction* of a rail-way, and the *principle and effects* of its operation are taken into view.

"The expense of a *double iron way* is variously estimated from 2000*l.* to 6000*l.* a mile. A rail-way from Liverpool to Manchester, recently granted by act of Parliament, is laid out upon the most extensive scale. It is sixty-six feet wide and *four sets* of tracks. The whole expense of the company, including land and warehouses at the two extremities, steam engines, wagons, and many other items, separate from the mere formation of the road is estimated at 12,000*l.* a mile; or for two sets of tracks 6,000*l.* When the expenses for land, storehouses in Manchester and Liverpool, expenses for steam engines, engine-houses, &c. are deducted, the cost for a mile will amount to 4,000*l.* A rail road from Newcastle to Carlisle, was estimated at 3,915*l.* a mile. A comparative estimate of various kinds of rail roads, amounting in all to upwards of five hundred miles, has been found to average about 4,000*l.* a mile, and with all the modern improvements, and extra expenses, to 5,000*l.* Many of these expenses are much beyond the necessary cost of constructing rail roads in this country, particularly for land, fences, and stone. There is already constructed in Great Britain near two thousand miles of rail-way, and many new routes are contemplated.

"Stone rail-ways are by far the most substantial and durable that have been yet invented. This is apparent from an examination of the rail-way at Quincy, where the iron bars are laid on long granite blocks.

"The expense of transportation on the rail-ways in England has been computed by Dr. Anderson, to be only one-tenth part of the amount it is upon the turnpike roads. And 'in South Wales,' it is stated in the Edinburgh Encyclopædia, 'a large uninhabited district of sterile mountains

may be said all at once, to have become the seat of populous towns and villages, by the introduction of the railway system.'"

The Committee will here close that part of their report which refers to the comparative advantages of canals and rail roads with the following extract, from an essay lately published in a London paper upon this subject:

From the [*London*] *John Bull.*

"*Steam.*—The strides which steam is making in the economy of the country, are more gigantic and surprising than those who are domesticated at a distance from its immediate operation imagine; but the capability of the locomotive engine to travel with ease and safety with a weight of ninety tons in its train, at the rate of eight miles an hour, having been proved by the opening of the Darlington and Stockton rail road, it becomes our duty to submit a more detailed statement of its powers and advantages, than we believe has yet appeared in print.

"The engine will travel over 25 miles 7 times a day, making 175 miles a day's work, with 90 tons, consuming 7 tons of small coals each day, or 42 tons per week, which at an average cost of 7*s.* will be 14*l.* 14*s.* One man and boy in constant attendance, supposing the 24 hours equal to three days, will be three men and three boys each day, which at 17*s.* 3*d.* will add 5*l.* 3*s.* 6*d.* and—making the total weekly expense 19*l.* 17*s.* 6*d.*—The engine will cost 600*l.*; 80 wagons 900*l.*—giving 1500*l.* for the entire set out.

"Now, 90 tons will load 6 boats; each of these boats will be a day in performing 20 miles; therefore 52 boats with 52 horses, 52 men and 52 boys, will be required to execute the transfer of 90 tons 175 miles in one day; each horse will cost weekly one guinea, each man a guinea, and boy 12*s.* forming a total weekly charge of 140*l.* 8*s.* [for expense of transportation by a canal,] in lieu of 19*l.* 17*s.* and

6d. [for the expense of the same transportation upon a rail road."]

The effect which the proposed rail-way would produce upon the value of real estate in our city, and upon the value of the lands through which the road would pass, will, perhaps, be sufficiently illustrated by the following estimates, extracted from the report of the Board of Engineers for Internal Improvement, concerning the proposed Chesapeake and Ohio Canal, laid before Congress, December 7th, 1826.

[Here follow extracts from the report of the United States Engineers, which has been published more at large, and may be found in No. 46, vol. 8, of the American Farmer.]

The very high and respectable authority from which we derive the foregoing estimate, must naturally inspire great confidence in its correctness. Assuming, therefore, that the advantages which might be expected from the Chesapeake and Ohio Canal, to the real estate which would participate in its benefits, are not over-rated, we will take the same data as precisely applicable to the proposed rail road, and the following results will appear:

Appreciation of real estate in the counties adjacent to the line of the road, as above estimated by the United States Board of Engineers, - - -	$12,000,000
In the Western States directly benefited by the road, - - - -	17,280,000
Present estimated value of real estate in Baltimore, . -	$20,000,000

50 per cent. appreciation upon the value of this real estate in consideration of the increase of the trade of that city, from the opening of this new and cheap means of communication between it and the West, being the same ratio assumed by the United States Engineers as applicable to the property

in the District of Columbia, the proposed terminating point of the Chesapeake and Ohio Canal, will be - - - 10,000,000

$39,280,000

Thus exhibiting an actual appreciation of the value of real estate interested in the proposed rail-way, of at least 39 millions of dollars, whilst the cost of executing the work is only estimated at 5 millions of dollars, and whilst the investment of this 5 millions could not fail to yield a profit to the stockholders of more than 10 per cent. per annum.

With a view of enabling the public to form a correct idea of *the amount of trade* which would probably pass upon a well constructed double rail road communication between the tide waters of the Chesapeake Bay and the navigable rivers of the West, the Committee submit the following further extracts from the report of the United States Engineers.

The Committee do not doubt but that the estimated amount of tonnage would pass upon the proposed rail road. The district of country which would mainly depend upon this route for the conveyance of its surplus produce, it will be recollected already contains nearly two millions of inhabitants, that is to say about one-fifth of the whole population of the United States, whilst the population depending upon the New York canal is not estimated to be more than about one million; and the receipts from the latter are stated to be as follows:

Receipt for the year	1824,	$340,761 07
	1825,	566,221 51
	1826,	765,000 00

There are a great variety of articles the product of the country west of the Alleghany mountains, which are now of little value in those countries, on account of the heavy

expenses unavoidably incurred in the transportation of them, to a port whence they could be shipped to a foreign market. With the facilities afforded by this road many of these articles could not only bear a transportation to Baltimore, but while they would furnish a constant and an increasing supply of freight upon the proposed road, they would become a source of great wealth to the people of the West.

To illustrate the truth of this assertion, it will only be necessary to refer to the single article of bread stuffs. A barrel of flour for instance, which would now command five dollars in Baltimore, would not, as an article of export *to that market*, be worth at Wheeling, on the Ohio river, more than one dollar; the cost of its transportation from that place by the present means of conveyance being four dollars; whereas upon the proposed rail road, the whole expense of transportation from the Ohio river to Baltimore, being estimated to be only at the rate of ten dollars per ton, the cost of carriage upon a barrel of flour would then be only one dollar; thus at once would its value, as an article of export, be enhanced in Ohio from one dollar to four dollars per barrel.

The expense of conveying cotton upon the proposed rail road from the Ohio river to Baltimore, including all charges, may be estimated at one quarter of a cent per pound, certainly not more than half a cent a pound; and coal from the Alleghany mountains near to Cumberland, including its cost at the pits, could be delivered in Baltimore at from 11 to 12 cents per bushel. Let us then apply this calculation to the other numerous productions of the western states, and we shall at once be convinced, that there is no scale by which we could venture to calculate the ultimate extent of the trade, which would flow into the state of Maryland, upon the proposed rail road, should its results approach any thing near to our present expectations.

No part of the country, included in these estimates, lies

nearer, by water, to New Orleans than 1200 or 1500 miles, (and *that* it should be recollected is the only market that could compete with us for this trade,) whilst a large portion of those districts lie 2000 miles distant from that city. By the estimates here furnished, it is manifestly clear, that the produce from a large portion of those countries can be delivered at Baltimore, at a less expense of transportation than they possibly can be carried to New Orleans.

Admitting the cities of New Orleans and Baltimore to stand in the same relative condition, as regards their claims to this trade, Baltimore, to say the least, might be expected to hold its share; but we should not lose sight of the important fact, that the productions of these extensive regions; excepting only cotton and tobacco, being principally bread stuffs, provisions and other perishable articles cannot be exposed to the deleterious effects of the climate of New Orleans, without the hazard of great injury; hence we find that considerable portions of the flour and provisions which go by the way of the Mississippi, are often so much damaged, as to be rendered unfit for exportation to a foreign market. Many valuable lives are also annually sacrificed to the climate, in the prosecution of the trade upon the Mississippi. What then has Baltimore to fear from New Orleans, in a conflict on equal terms for their trade?

To convince any one that there is no probability that the trade here estimated will be likely hereafter to decline, it will only be necessary to observe, that the population, upon which the calculations are founded, is rapidly increasing every year, and that it must for several succeeding generations, still continue to increase. The country around the Chesapeake Bay was first settled by Europeans, about the year 1632, and in the year 1800 the white population had barely reached as far west as the Ohio river; that is to say, in 160 years it had advanced westward about 400 miles, or at the rate of two and a half miles per year. There is now a dense population ex-

tending as far west as the junction of the Osage river with the Missouri; which is about nine hundred miles west of the Ohio river at Wheeling; of course the white population has, within the last thirty years, travelled that distance, or more than thirty miles each year, and is at this time advancing with as great, if not greater impetus, than at any former period: and according to all probability, if not checked by some unforseen circumstances, it will, within the next thirty years reach the Rocky mountains, or even to the Pacific ocean. We have therefore, no reason to look for any falling off in this trade, but on the contrary, for an increase of it, to an extent of which no estimate could now be formed.

In conclusion, the Committee beg leave to refer to the annexed tables, numbered from 1 to 7 in which they have arranged, under a condensed form, some of the more important facts and statements embraced in this report. The Committee have also in these tables contrasted the advantages, which, in their opinion, would be likely to accrue to the city of Baltimore, from connecting her trade with the western states, by intersecting the contemplated Chesapeake and Ohio canal within the District of Columbia, and by A DIRECT RAIL ROAD FROM BALTIMORE TO SOME ELIGIBLE POINT ON THE OHIO RIVER.

All which is respectfully submitted.

PHILIP E. THOMAS,
Chairman of the Committee.

[We have here given nearly the whole of the report of the Committee, the facts and the reasoning appearing to be of a general character, and likely to prove instructive to those who wish to understand the general subject.

The report was unanimously accepted by the meeting—a resolution was then adopted to appoint a Committee of twenty-five citizens on its behalf, to prefer an application

to the Legislature for an act to incorporate a joint stock company, under the title of "THE BALTIMORE AND OHIO RAIL-WAY COMPANY," and the following persons were accordingly designated for that purpose.

Charles Carroll of Carrollton, William Patterson, Isaac M'Kim, Robert Oliver, Charles Ridgely of Hampton, Thomas Tenant, Alexander Brown, John M'Kim, Jr., Talbot Jones, James Wilson, Thomas Ellicott, George Hoffman, William Steuart, Philip E. Thomas, William Lorman, George Warner, Benj. C. Howard, Solomon Etting, W. W. Taylor, Alexander Fridge, James L. Hawkins, John B. Morris, Luke Tiernan, Alexander M'Donald, Solomon Birckhead.]

TABLE, No. 1.

Estimated difference in the distance between connecting the city of Baltimore with the western trade, by a continuous canal, intersecting the eastern termination of the proposed "Chesapeake and Ohio canal," within the District of Columbia, and of connecting Baltimore with this trade by a rail-way, direct from that city to some suitable point on the Ohio river.

The United States Engineers report the length of the "Chesapeake and Ohio canal," from the city of Washington to Pittsburg, on the Ohio river to be	341½ miles
Estimated length of a canal from Baltimore, to intersect the "Chesapeake and Ohio canal," at Washington,	48½ miles
Whole distance of a canal by this route, from Baltimore to Pittsburg,	390 miles
Estimated distance of a rail-road, from the city of Baltimore to Wheeling, or some other suitable point on the Ohio river,	250 miles
Distance saved by a rail-road,	140 miles

TABLE, No. 2.

Comparative cost of constructing a canal communication between the city of Baltimore and the Ohio river, by the proposed route of the "Chesapeake and Ohio canal," and by the proposed *direct* rail-road communication between Baltimore and that river.

The United States Engineers estimate the cost of the proposed canal from Washington to Pittsburg, to be ($22,375,427,) twenty-two millions, three hundred and seventy-five thousand, four hundred and twenty-seven dollars; but we will suppose it could be made for one half of this sum, or	$11,000,000 00
To which should be added the cost of constructing a continuous canal from the city of Baltimore to the eastern termination of the "Chesapeake and Ohio canal," at Washington, that being the only point at which we can intersect it,	1,000,000 00
	$12,000,000 00
The highest estimate cost of a rail road from Baltimore to the Ohio river, calculating the same to cost $20,000 per mile, (and this is believed to be a very high estimate,) would be	$5,000,000 00
Amount of capital saved in favour of a rail-road,	$7,000,000 00

TABLE, No. 3.

Estimated difference of expense on transportation for tolls only, by the proposed canals from Baltimore through the District of Columbia to Pittsburg, and by a direct rail road route from Baltimore to some point on the Ohio river.

The United States Engineers estimate the cost of transportation by the proposed Chesapeake

and Ohio canal, at the rate of 1½ cents for each ton per mile—taking the whole distance then from Baltimore to Pittsburg, as is shewn in Table, No. 1, to be 390 miles; the tolls for conveying a ton of freight from Baltimore, the whole distance along this canal would be	$5 85
Tolls for carrying the same freight along the proposed rail road at the same rate per mile, the distance being 250 miles, would be	3 75
Amount of freight saved per ton in favour of a rail road, at the same charge for tolls, would be	$2 10
In order however to show the actual saving by the rail road, it is necessary to remark, that the proposed charge along it, is not 1½ cents per ton each mile, as charged on the canal, but 1 cent per ton each mile, and this will give a further advantage in favour of the road on each ton of	1 25
Making the difference per ton in favour of the rail road, to be	$3 35

TABLE, No. 4.

Estimate of the income which the proposed rail-road from Baltimore to some point on the Ohio river, would annually yield, computing the freight which would pass upon this road to be only 150,000 tons from west to east, and the amount that would pass from east to west, to be 50,000 tons.

150,000 tons from west to east at 1 cent per ton per mile, being the New York canal price,	$375,000 00
50,000 tons from east to west at 3 cents per ton per mile, being the New York canal price,	375,000 00
Total amount of tolls,	$750,000 00

TABLE, No. 5.

Estimate of profits to the holders of stock in the proposed Baltimore and Ohio rail-road.

Expense of constructing the proposed road, being estimated at $20,000 per mile, and the distance being assumed to be 250 miles, would make the whole cost five millions of dollars,	$5,000,000 00
Six per cent. interest on the above capital invested, would be	$300,000 00
Income from tolls as is shewn by Table, No. 4,	750,000 00
Which leaves $450,000 for repairs, contingent expenses, and surplus dividends,	$450,000 00

TABLE, No. 6.

Estimated difference of the time it would take for conveying freight from Baltimore to Pittsburg, by the proposed Chesapeake and Ohio canal, between those places, (through the District of Columbia,) and by a direct rail road from Baltimore to some point on the Ohio river.

The United States Engineers, (page 38,) estimate the time it will take to travel with loaded boats from Washington to Pittsburg, to be	188 hours
The distance between these points being 341 miles, we have only to add the same rate of travelling for the additional distance from Baltimore to Washington, say 48½ miles, and the additional time will be	26½ hours
Time employed in passing on the proposed canals, from Baltimore to Pittsburg,	214½ hours

There is abundant evidence to prove, from authentic documents published, that the

rate of travelling upon rail roads, with the locomotive engines, in England, (and this has been sufficiently shewn to be the cheapest means,) is, with heavy loaded wagons, from 4 miles to 6 miles, and even 8 miles per hour; assuming however the slowest rate, and the passage will be made from Baltimore to the Ohio river, say 250 miles, at the rate of 4 miles per hour, is, 62½ hours

Time saved in favour of the rail road, each trip, 152 hours

TABLE, No. 7.

Synopsis of the six preceding Tables.

TABLE 1.

Distance between Baltimore and Pittsburg, by the proposed Chesapeake and Ohio canal,	390 miles
Distance from Baltimore to the Ohio river, by the proposed rail road,	250
Distance saved by the road,	140 miles

TABLE 2.

Smallest estimated cost of the proposed Chesapeake and Ohio canal,	$12,000,000
Highest estimated cost of the contemplated rail road,	5,000,000
Amount of capital saved in favour of the road,	$7,000,000

TABLE 3.

Cost of transporting, for tolls only, on a ton of freight from Pittsburg to Baltimore, upon the Chesapeake and Ohio canal,	$5 85
Cost of same transportation by the proposed rail road,	2 50
Tolls saved on each ton, by the rail road,	$3 35

TABLES 4 & 5.

Annual income from tolls upon the proposed rail road,	$750,000
Six per cent. interest on the capital invested,	300,000
Annual surplus profits to be appropriated for repairs and extra dividends,	$450,000

TABLE 6.

Time employed in passing a boat from Baltimore to Pittsburg, by the Chesapeake and Ohio canal,	214½ hours
Time to pass from Baltimore to the Ohio river, upon the proposed rail road,	62½ hours
Time saved by the road, each trip,	152 hours

THE DISEASE IN PEAR TREES.

THIS very alarming complaint has appeared to increase within the last two years, and since the publication of our last number there is much additional evidence, tending to confirm the opinions which we have uniformly expressed, that it is the work of insects; of the larva of some wood eating insect. Our opinions were founded on the following facts, that the disease made its appearance in the healthiest trees; that it appeared in trees growing in all sorts of soils; in lands manured highly, and in lands, which had never been manured; that there were no preceding symptoms of disease, and no succeeding ones after the extirpation of the diseased parts, except with the same appearances; in other words, the rest of the trees continued to enjoy good health, but above all, that the disease always appears at the same season of the year, which corresponds with the period of the appearance of the insect.

There never would have been any doubt on the subject if persons had detected the depredator, but it had never been seen except by Professor Peck, and Mr. Lowell. The former saw the insect in the branch, and found it to be a wood eating insect of a genus well known as a destructive one.

This spring, in April, Benjamin Gorham, Esq. brought to us a twig of a decayed pear branch, in which was the larva of a wood eating insect alive; it is now before us together with the twig. The larva is white, and about half an inch long; the heart of the twig is wholly eaten out, and some of the albumum. Its ravages were quite great enough to destroy all the twigs above it and some distance below. We must acknowledge that we have some doubts whether this is the larva of the Scolytus Pyri, described by Mr. Peck; it seems to us to be too large for it. We have seen still more convincing proofs that the disease in the pear tree is the work of an insect. Last year several fine pear trees, in the garden of E. Hersey Derby, Esq. in Salem, were attacked with precisely the same symptoms which have been described by others, and long known under the name of fire blight. The limbs, and leaves, and fruit, became black and hard in the space of a few days. On a thorough examination of the diseased limbs, there were the most marked proofs of the ravages of insects. Mr. Derby brought several pieces of the wood to the meeting of the Trustees of the Massachusetts Society, for promoting Agriculture, and the same were examined; no doubt could be entertained that these limbs at least had been destroyed by insects. Mr. Derby himself said he had no doubt of it. Whether the insect which destroyed Mr. Derby's trees was the Scolytus, or another undiscovered enemy, we cannot say. The injury appeared to be more extensive than we should apprehend that which the Scolytus could make. Time, and careful attention will explain this mysterious affection of the pear tree.

ORCHARD GRASS.

As we gave great praise to this grass in our last number, and have spoken favorably of it in the present one, we should be guilty of unfairness should we fail to publish the following letter from a correspondent of the American Farmer, who appears to be experimentally acquainted with it, and who writes in a fair and impartial manner on the subject. Our own knowledge has been derived from John Prince, Esq., and we have always understood from him, that it was as valuable for hay as it most unquestionably is for soiling and pasture.

Union-Town, May 19, 1827.

Sir,—The introduction and culture of the grasses has been (where they have been properly attended to,) of immense benefit to the agriculturist in this country, as well as elsewhere, in the general improvement of his farm and immediate profits of his stock. So far as we have gone into the system, and varied it to suit the peculiarities of our climate, so far we have done well. But, in general, we have been too much disposed to take up the views and practices as they are handed to us from the other side of the Atlantic. It is certainly right that we try whatever their system recommends to us, but it is not right that we be satisfied *only* to try it in *their* way. Here, indeed, is our error. We must do exactly as they have done; and if the result is bad, the course is condemned and abandoned as one that is ruinous, or comparatively bad. And all this, perhaps, for the want of a little attention and management in matters, so as to suit it to the peculiarities of our climate, and the general principles by which we regulate our farms.

These reflections have grown out of some observations made by the writer of this article (among other matters,) on the culture and application of the orchard-grass, (*Dactylis glomerata.*) Great efforts were made to introduce it into use as a grass for hay, and so successful was Mr.

P——, in the introduction of it into the neighborhood of Philadelphia, that it has nearly driven that best of all grasses for hay, (timothy,) out of their meadows. But with us, it has not been so. The rage is over. It was found, as a hay-grass, to fall very far below the expectations excited by the extraordinary representations of its friends. The grass, when made into hay, was found to be light and weak, when compared with timothy, and by no means proper to be substituted for that grass in our meadows, and therefore to be abandoned altogether.

Now, in our opinion, the whole of this is wrong. It was wrong in the friends of orchard grass to have made it every thing, and above every thing of its kind; and it was equally wrong in him who tried it to have been discouraged when he found it would not answer for hay. He should have set his head to work, and his hands too, to know if it could not be used to more or better advantage in some other way; and whether it might not be a useful auxiliary in grazing or soiling. Our own observations and experience have led us to believe that it might be introduced in this way to great advantage. I will here throw together some of its valuable properties as a grass for that purpose.

It is an early grass. In general it will afford a sufficient growth of vegetation to *turn on* by the middle of April. It is rapid in its growth. No grass that we have can exceed it in putting forth, after it has been eaten off. It is abundant in foliage. The flowering stems are few, comparatively, and by proper management in eating it off, the whole may be consumed. In times of excessive drought, it will be refreshed and grow vigorously from showers that would make no impression on the clover crop. Its roots, being near the surface, immediately drink in the refreshing shower as soon as it touches the earth; while the tap root of the clover, waiting for the earth to become saturated, is disappointed by the exhalations of the superficial moisture, and again droops its half withered leaf. The fibrous lateral roots of the orchard grass, in conjunction with the circumstance of its not forming into a compact sod, but each tuft being separate from the others, gives us a high opinion of

its adaptation to our climate. In this respect it has the same advantage over clover that corn has over root crops. However, we are not at all disposed to think that it ought to supersede the culture of clover. For the improvement of land, no grass has yet been found to equal clover; in this respect it stands first. What we have stated, is only to show that orchard grass would be a valuable *auxiliary* to the grazier, and should cover a part of his grazing ground. Every man must know that has fattened cattle on grass, how important it is to get them out early, while the weather is comparatively cool, and before the flies begin to worry them, so that they can neither eat nor rest in the day time. And who does not know the importance of meadow pasture, natural and artificial, of the spire grass kind, to finish the fattening in the closing of the season. After harvest, clover is generally good for nothing to fatten stock: for if it be a wet season, they *slabber* all their substance away; and if dry, which is mostly the case, there is nothing to eat. Here, then, a grass is offered to us that supplies the defects of clover, and will answer all the purposes of meadow for late pasture. Should such a grass be entirely excluded from our system? Or should we not rather use it to promote our prosperity in the way it offers, and which is most suitable to its nature? Z.

POTATOES.

We have, at various times, said much about the importance of attending more than we have ever yet done to the qualities of our potatoes as food; to their fitness for the table. We may be said to eat the worst potatoes in Massachusetts [not Maine where they have the best] of any State which pretends to raise them.

The old red Cranberry potato was a good one, and was thought to be extinct. Last year we met with them again very large and fair, but their goodness was gone. The history given to us of them was, that when they had nearly run out here, they were sent to the eastern part of Maine, where they revived and flourished, and were sent back

again to Boston. We bought a bushel or two, and planted them; they produced miserably, and were utterly worthless. We consider them as run out.

The Chenango potato, a Pennsylvania variety, we earnestly recommend as valuable for the table. It is remarkably early; very fair sized potatoes can be had from them in sixty days.

We had till this year supposed that their great excellence consisted in their being fine in summer and fall. We can now add that they continued fine till the 20th of May, and are now, on the 6th of June, better than any we have.

We have spoken highly of the Foxite potato, which is the great favorite in Pennsylvania, where it is preferred to the Chenango. It is a late potato, and not so showy as the Chenango. We had supposed that the Foxite was a variety produced in Pennsylvania, but we find them claimed as a New Jersey production by Mr. Buck, of Bridgeton, New Jersey. In a letter to the Editor of the American Farmer, he says, " with respect to the Foxite potato, I can truly say that they deserve all the commendations you have heard of them; they are certainly the finest potato cultivated in this country, remarkably white and mealy; and to use the expression of a gentleman with whom I was conversing on the subject and who has raised them for some years, '*they are* as much *superior* to *other* potatoes as the best superfine wheat flour is to common rye flour;' the only objection to them is, that they are poor bearers, and yield so badly as to discourage their cultivation. We grow another potato here called the Mercer potato, which is next in repute for the table and yields bountifully."

So far Mr. Buck's authority, which we can confirm from experience in all points, except that we have found it a very fair bearer. But until we can come to the European rule, which is to select the best eating potato for the table, and resting contented with small crops, we shall never have good ones on our tables. Every good variety of potato in France, Great Britain, and America, are small bearers compared with the coarser, or what we may call the cattle

sorts. The mangel wurtzel beet is a much greater bearer than the blood red, yet who would put the mangel wurtzel on the table? We can furnish those who may be disposed next year or the present to try the Foxite or Chenango with seed potatoes. There is a celebrated potato in Rhode Island called the Elam, which we have now under trial here.

ANNUAL CATTLE SHOW.

The Trustees of the Massachusetts Society for the promotion of Agriculture, encouraged by the patronage of the Legislature of this State, intend to offer in premiums, not only the sum granted by the Government for that purpose, but also the whole amount of the income of their own funds. They therefore announce to the public their intention to have a Cattle Show and exhibition of Manufactures, &c. at Brighton, on Wednesday the 17th of October 1827—☞The whole business to be transacted in one day instead of two as heretofore. The following premiums are offered.

FOR STOCK.

For the best Bull, raised in Massachusetts, above one year old - - - - -	$30
For the next best, do. do. - - -	20
For the next best, do. do. - - -	10
For the best Bull Calf, from five to twelve months old	15
For the next best, do. do. - - -	10
For the next best, do. do. - - -	5
For the best Cow, not less than three years old -	30
For the next best, do. do. - - -	20
For the next best, do. do. - - -	15
For the best Heifer (having had a calf,) - -	15
For the next best, do. do. - - -	10
For the best Heifer, (not having had a calf,) -	12
For the next best, do. do. - - -	10
For the next best, do. do. - - -	8
For the next best, do. do. - - -	6
For the best Ox, fitted for slaughter, regard to be had to, and a particular statement to be given of, the mode and expense of fatting, - - -	25
For the next best, do. do. - - -	20

For the next best, do. do. - - - 10
For the best pair of Working Oxen - - 25
For the next best, do. do. - - - 20
For the next best, do. do. - - - 15
For the next best, do. do. - - - 12
For the next best, do. do. - - - 8

[No oxen will be admitted to trial as *working oxen* under *four* years old.]

For the best Merino Ram - - - 15
For the next best, do. do. - - - 10
For the best Merino Ewes, not less than five in number 20
For the next best, do. do. do. - - - 10
For the best Boar, not exceeding two years old, to be kept at least one year for breeding, - - 12
For the next best, do. do. - - - 8
For the next best, do. do. - - - 5
For the best Sow, to be kept at least one year for breeding, - - - - - 12
For the next best, do. - - - - 8
For the next best, do. - - - - 5
For the best Pigs, not less than two in number, nor less than four months old, nor more than eight - 10
For the next best, do. - - - - 5

None of the above animals will be entitled to premiums, unless they are *wholly bred* in the state of Massachusetts.

Any of the above stock, when raised and still owned at the time of the exhibition by the person who raised them, will entitle the claimant to an allowance of ten per cent. in addition. But sheep, to be entitled to any of the above premiums, must be raised by the person entering them.

NEW PREMIUMS FOR SHEEP.

For the best Dishley or New Leicester Ram - $15
For the best, do. do. Ewe - - - 15
For the best South Down Ram - - - 15
For the best, do. Ewe - - - - 15

The above four premiums will be awarded on sheep either imported or raised in the state.

The persons claiming these premiums to engage to keep the imported animals within the state.

No animal, for which to any owner one premium shall have been awarded, shall be considered a subject for any future premium of the Society, except it be for an entirely distinct premium, and for qualities different from those for which the former premium was awarded.—*Any animal which shall have obtained a premium as a Milch Heifer shall not afterwards be entered for premium as a Milch Cow.*

FOR GRAIN AND VEGETABLE CROPS.

To the person who shall raise the greatest quantity of Indian Corn on an acre, not less than one hundred bushels - - - - - - $20

To the person who shall raise the greatest quantity of vegetables, (grain, peas and beans excepted,) for winter consumption, of the stock of his own farm, and not for sale, in proportion to the size of the farm and stock kept, having regard to the respective value of said vegetables as food, stating the expense of raising the same, and the best mode of preserving the same through the winter - - - - - 30

To the person who shall raise the greatest quantity of Winter Wheat on an acre, not less than thirty bushels 20

To the person who shall raise the greatest quantity of Spring Wheat on an acre, not less than thirty bushels 20

To the person who shall raise the greatest quantity of Barley on an acre, not less than forty-five bushels 20

To the person who shall raise the greatest quantity of Rye on an acre, not less than thirty bushels - 20

To the person who shall raise the greatest crop of Millet on an acre, cut and cured for hay, not less than three tons, the claimant giving evidence of the time of sowing, the quantity of seed sown, and the quantity of hay produced - - - - - 20

To the person who shall raise the greatest quantity of Carrots on an acre, not less than six hundred bushels 20

To the person who shall raise the greatest quantity of Potatoes on an acre, not less than five hundred bushels 20

To the person who shall raise the greatest quantity of common Beets on an acre, not less than six hundred bushels - - - - - - 20

To the person who shall raise the greatest quantity of Sugar Beets on an acre, not less than six hundred bushels 20
To the person who shall raise the greatest quantity of Parsnips on an acre, not less than four hundred bushels 20
To the person who shall raise the greatest quantity of Mangel Wurtzel on an acre, not less than six hundred bushels - - - - - 20
To the person who shall raise the greatest quantity of Ruta Baga on an acre, not less than six hundred bushels 20
To the person who shall raise the greatest quantity of Turnips on an acre, not less than six hundred bushels 20
To the person who shall raise the greatest quantity of Onions on an acre, not less than six hundred bushels 20
To the person who shall raise the greatest quantity of Cabbages on an acre, not less than twenty-five tons' weight, free from earth when weighed - 20
To the person who shall raise the greatest quantity of dry Peas on an acre, not less than thirty bushels 20
To the person who shall raise the greatest quantity of dry Beans on an acre, not less than thirty bushels 20
To the person who shall give proof of having produced the largest quantity of dressed Flax, raised on half an acre, and not less than two hundred and fifty pounds 20

To entitle himself to either of the premiums for Grain or Vegetable crops, the person claiming must cultivate a tract of at least one acre in one piece, with the plant or production for which he claims a premium, and must state in writing, under oath of himself, and one other person, (accompanied by a certificate of the measurement of the land by some sworn surveyor,) the following particulars:

1. The state and quality of the land in the spring of 1827.
2. The product and general state of cultivation and quantity of manure employed on it the year preceding.
3. The quantity of manure used the present season.
4. The quantity of seed used, and if Potatoes, the sort.
5. The time and manner of sowing, weeding, and harvesting the crop, and the amount of the product, ascertained by actual measurement, after the whole produce, for which

a premium is claimed, is harvested, and the entire expense of cultivation.

6. In regard to Indian Corn, the entire crop of the acre offered for premium, if shelled, must be measured between the 15th November and 1st December. If not shelled, the whole must be weighed within the same dates, and the trustees have determined to consider *seventy-five pounds of corn and cob* as equivalent to one bushel of shelled corn.

And in relation to all vegetables, (except Potatoes, Onions, and common Turnips,) at least *forty* bushels must be weighed, and *fifty-six pounds* will be considered as equal to one bushel, free from dirt.

AGRICULTURAL EXPERIMENTS.

For a mode of extirpating the worm that attacks the Locust Tree, which shall appear to the satisfaction of the Trustees to be effectual - - - $50

For a mode, hitherto unknown, to extirpate the *Borer* that attacks the Apple Tree, which shall appear to the satisfaction of the Trustees to be effectual and cheaper than any mode now in use - - 50

To the person who shall give satisfactory evidence on "Soiling Cattle," not less than six in number, and through the whole season, together with a particular account of the food given, and how cultivated 30

To the person who shall make the experiment of turning in Green Crops as a manure, on a tract not less than one acre, and prove its utility and cheapness, giving a particular account of the process and its result - - - - - - 20

To the person who shall prove to the satisfaction of the Trustees, that his mode of rearing, feeding, and fattening Neat Cattle is best - - - 20

To the person who shall prove to the satisfaction of the Trustees, the utility and comparative value of the Cobs of Indian Corn, when used with or without the grain itself, ground or broken - - 20

The claim under the two last heads, together with the

evidences of the actual product, must be delivered, free of expense, to Benjamin Guild, Esq. in Boston, Assistant Recording Secretary of this Society, on or before the first day of December next—the Trustees not intending to decide upon claims under the head of Agricultural Experiments, until their meeting in December.

BUTTER, CHEESE, HONEY, CIDER, CURRANT WINE.

To the person who shall take up in the season, on his own farm, the greatest quantity of good Honey, and shall at the same time exhibit superior skill in the management of Bees. [If there be any thing supposed to be new in the management, the same to be communicated in writing.] - - - $10

For the best Cheese *not less* than one year old, and not less in quantity than one hundred pounds - - 10

For the next best, do. do. - - - 5

For the next best Cheese *less* than one year old - 10

For the next best, do. do. - - - 5

For the best Butter, not less than fifty pounds - 15

For the next best, do. do. - - - 10

For the next best, do. do. - - - 7

For the next best, do. do. - - - 5

For the greatest quantity of Butter and Cheese, made between the 15th of May, and the 1st of October, from not less than four cows, the quantity of butter and cheese, and the number of cows, to be taken into consideration, and specimens to be exhibited at the Show, of not less than twenty pounds of each, and the mode of feeding, if any thing besides pasture was used 20

For the best specimen of Cider, not less than one barrel, made in 1826, manufactured by the person who shall exhibit the same, and from apples grown on his own farm - - - - - 15

For the second best barrel - - - 10

The person obtaining the first premium shall be entitled to a further sum of $5, as a compensation for the premium barrel of Cider, which will be retained and used at the Show Dinner, in order that he may have the credit of it.

[These premiums will be continued in future years. Persons claiming them must state, in writing, their process of making and managing their cider, and the kind of apples used.]

For the best specimen of Currant Wine, not less than one gallon, exhibited by any person who shall have made not less than 30 gallons, in the same season in which that which shall be exhibited was made, (a statement to be given, in writing, of the process of making the same,) - - - - $10

For the next best, do. - - - - 5

FOR INVENTIONS.

To the person who shall use the Drill Plough or Machine, and apply it most successfully to the cultivation of any small grains or seeds, on a scale of not less than one acre - - - - $20

To the person who shall invent the best Machine for pulverising and grinding Plaster to the fineness of twenty-five bushels per ton, and which shall require no more power than a pair of oxen or a horse, to turn out two tons per day, and so portable that it can be moved from one farm to another without inconvenience - - - - - - 30

To the person who shall produce at the Show, any other Agricultural Implement, of his own invention, which shall, in the opinion of the Trustees, deserve a reward, a premium not exceeding *twenty dollars*, according to the value of the article exhibited.

In all cases proofs must be given of the work done by the Machine, before it is exhibited; and of its having been used and approved by some practical farmer.

Persons who have taken out patents for their inventions are not thereby excluded from claiming any of the above premiums.

No claimant will be entitled to a premium, unless in the opinion of the Committee, the machine or implement presented by him shall be superior to any designed for the same use, which shall have heretofore gained a premium.

FOR RAISING TREES AND HEDGES.

To the person who shall, on or before the 1st day of December, 1829, produce proofs of having raised the greatest amount in value of Mulberry Plants, either in standards, dwarfs or in hedges, for the purpose of raising the Silk Worm, and shall exhibit not less than *five pounds* of unmanufactured or raw silk of his own production - - - $100

For the best plantation of White Oak Trees, not less than one acre, nor fewer than one thousand trees per acre, to be raised from the acorn, and which trees shall be in the best thriving state on the 1st of September 1827 - - - - - 100

For the best plantations of White Ash, Larch or Locust trees, each of not less than one acre, nor fewer than one thousand trees per acre, to be raised from the seeds, and which trees shall be in the best thriving state on the 1st of September, 1827 - - 50

For the best Live Hedge, made either of White or Cockspur Thorn, planted after 1820, not less than one hundred rods, and which shall be in the best thriving state in 1827 - - - 50

For the best Buckthorn Hedge, not less than one hundred rods, and which shall be in the best thriving state in 1828 - - - - - 50

To the person who shall have planted out on his farm, since the spring of 1816, the greatest number of Apple Trees, not less than one hundred in number, and who shall exhibit to the Trustees, at the Show in 1827, satisfactory evidence of his having managed them with care and skill - - - 50

FOR DOMESTIC MANUFACTURES.

To the person or Corporation who shall produce the best specimen of fine Broadcloth, not less than 1 5-8 yards wide, exclusive of the list, forty yards in quantity, and dyed in the wool - - - $20

For the second best, do. do. - - - 15

For the best superfine Cassimere, not less than 3-4 yard wide, nor less than forty yards in quantity - 12
For the second best, do. do. - - - 8
For the best superfine Sattinet, 3-4 yard wide, not less than fifty yards - - - - 8
For the second best, do. do. - - - 5

FOR HOUSEHOLD MANUFACTURES.

For the best Woollen Cloth, 3-4 yard wide, not less than twenty yards in quantity - - 12
For the second best, do. do. - - - 8
For the best double milled Kersey, 3-4 yard wide, not less than twenty yards in quantity - - 12
For the second best, do. do. - - - 8
For the best Coating, 3-4 yard wide, not less than twenty yards in quantity - - - - 8
For the second best, do. do. - - - 6
For the best Flannel 7-8 yard wide, not less than forty-five yards in quantity - - - - 10
For the second best, do. do. - - - 7
For the best yard wide Carpeting, not less than thirty yards in quantity - - - - 15
For the second best, do. do. - - - 7
For the best 5-8 yard wide Stair Carpeting, not less than thirty yards in quantity - - - 10
For the second best, do. do. do. - - 7
For the best pair of Blankets, not less than 8-4 wide and 10-4 long - - - - - 6
For the second best, do. do. do. - - 4
For the best Woollen Knit Hose, not less than 12 pair in number - - - - - 5
For the second best, do. do. - - - 3
For the best Worsted Hose, not less than 12 pair in number - - - - - 5
For the second best, do. do. - - - 3
For the best Men's Half Hose (woollen) not less than 12 pair in number - - - - 4
For the second best, do. do. - - - 2

For the best Men's Woollen Gloves, not less than 12 pair in number - - - - 5
For the second best, do. do. - - - 3
For the best Linen Diaper, 5-8 yard wide, not less than 30 yards in quantity - - - - 3
For the second best, do. do. - - - 3
For the best yard wide Diaper (for table linen) not less than 10 yards in quantity - - - 10
For the second best, do. do. - - - 5
For the best specimen of Sewing Silk, raised and spun in this State, of good fast colours, not less than one pound - - - - - 5
For the second best, do. do. - - - 3
For the best Linen Cloth, (for shirting or sheeting) one yard wide, and twenty-five yards long - 8
For the second best, do. do. - - - 4
To the person who shall produce the best specimen of any Cotton Fabrics manufactured in private families, not less than 5 pieces - - - 20

All of the above manufactures must be manufactured within the state of Massachusetts. And all manufactures, when presented, must have a private mark, and any public or known mark must be completely concealed, so as not to be seen or known by the Committee, nor must the Proprietors be present when they are examined; in default of either of these requisitions, the articles will not be deemed entitled to a consideration or premium.

Animals, or manufactured articles, may be offered for a premium at Brighton, notwithstanding they may have received a premium from a County Agricultural Society.

It is understood, that whenever, merely from want of competition, any of the claimants may be considered entitled to the premium, under a literal construction, yet if, in the opinion of the Judges, the object so offered is not deserving of any reward, the Judges shall have a right to reject such claims. Persons to whom premiums shall be awarded, may, at their option, have an article of plate with

suitable inscriptions, in lieu of money. Premiums will be paid within ten days after they shall be awarded.

That in any case in which a pecuniary premium is offered, the Trustees may, having regard to the circumstances of the competitor, award either one of the Society's gold or silver medals in lieu of the pecuniary premium annexed to the several articles.

That if any competitor for any of the Society's premiums shall be discovered to have used any disingenuous measures, by which the objects of the Society have been defeated, such person shall not only forfeit the premium which may have been awarded to him, but be rendered incapable of being ever after a competitor for any of the Society's premiums.

All premiums not demanded within six months after they shall have been awarded, shall be deemed as having been generously given to aid the funds of the Society.

PLOUGHING MATCH.

On the 17th day of October, Premiums will be given to the owners and ploughmen of three Ploughs, drawn by two yoke of oxen, and to the owners and ploughmen of three ploughs drawn by one yoke of oxen, which shall be adjudged by a competent committee, to have performed the *best work with the least expense of labour*, not exceeding half an acre to each plough. And that entries may be made of the names of the competitors until the morning of the 17th. Preference will be given to those who enter first; but if, on calling the list at the hour appointed, precisely, those first named do not appear, the next in order will be preferred. There will be two Committees of three persons each—one to be the judges of the ploughing by double teams, the other of the ploughing by single teams—the latter to have assigned to them a part of the field distinct from that of the double teams.

Premiums as follows, (being the same for the double and single teams.)

First Plough	$15	Second Plough	$10	Third Plough	$6
Ploughman	8	Ploughman	5	Ploughman	3
Driver	4	Driver	3	Driver	2

In each case, if there be no driver, both sums to be awarded to the ploughman.

The persons intending to contend for these Prizes, must give notice in writing to J. WINSHIP, Esq. of Brighton. The competitors will also be considered as agreeing to follow such rules and regulations as may be adopted by the Committees on the subject. The ploughs to be ready to start at 9 o'clock, A. M.

☞ All persons having articles or animals to offer at the Show, will please take notice, that such alterations have been made in the arrangement, as to bring the whole into *one day*—therefore

All *Manufactures* and *Implements* must be brought to the Hall, and entered on *Monday*, the 15th, to be examined on Tuesday, the 16th.

Also Butter, Cheese, Honey, Cider, and Currant Wine on same day, for entry and examination.

All entries of Animals for the Pens, or as Working Cattle, must be entered before Tuesday evening, the 16th, so as to be arranged by 9 o'clock in the morning of Wednesday, the 17th, for public examination.

The Ploughing Matches will commence on *Wednesday* morning, at ½ past 9 o'clock *precisely*.

Trial of Working Oxen at 11 o'clock *precisely*.

The Public Sales of Manufactures and Animals at 12 o'clock.

The applicants will be held to a rigid compliance with this rule relative to entries as well as the other rules prescribed.

Besides such animals as may have been offered for Premiums, any others that are considered by them as possessing fine qualities will be admitted for sale. And for all Animals or Manufactures, that are intended to be sold, notice must be given to the Secretary, before 10 o'clock of the 17th.—Auctioneers will be provided by the Trustees.

By order of the Trustees,

R. SULLIVAN, J. PRINCE,
G. PARSONS, E. H. DERBY,

January, 1827. *Committee.*